

## RESEARCH ARTICLE

# Do Men with Eating Disorders Differ from Women in Clinics, Psychopathology and Personality?

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## Abstract

**Objective:** To determine if male and female eating disorders differ in clinics, psychopathology and personality traits when compared with a healthy group.

**Methods:** Sixty male and 60 female eating disorder individuals (16% anorexia nervosa, 42% bulimia nervosa and 42% eating disorder not otherwise specified), matched for age and diagnostic, were compared with 120 healthy-eating participants (60 male and 60 female participants). All were diagnosed according to the criteria of the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision. Assessment measures included Eating Disorder Inventory—2, Symptom Checklist—Revised and Temperament and Character Inventory—Revised, as well as other clinical and psychopathological indices.

**Results:** Male eating disorder participants reported significant lower laxative abuse ( $p=0.020$ ) and significant higher vomiting episodes ( $p=0.019$ ) than female eating disorder participants. Differences on drive for thinness, body dissatisfaction and some Symptom Checklist—Revised scales were found across genders in eating disorder participants. Male eating disorder participants scored significantly lower than female participants with eating disorders on harm avoidance, reward dependence and cooperativeness.

**Conclusions:** Although eating disorder clinical features were similar across genders, male eating disorder participants had less body image concern and general psychopathology than female eating disorder participants. Copyright © 2011 John Wiley & Sons, Ltd and Eating Disorders Association.

## Keywords

males; eating disorders; anorexia nervosa; bulimia nervosa; EDNOS

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## Introduction

Eating disorders (ED) are less frequent in male participants than in female participants (5–12% of cases) (Button, Aldridge, & Palmer, 2008; Kjelsås, Bjørnstrøm, & Gotestam, 2004). Epidemiology studies have been carried out in both clinical and community populations. In clinical settings, male participants make up 5–10% of people with anorexia nervosa (AN) who seek treatment (Striegel-Moore, Garvin, Dohm, & Rosenheck, 1999a), 10–15% of people with bulimia nervosa (BN) (Carlat, Camargo, & Herzog, 1997) and 40% of cases with binge eating disorder (Muese, Stein, & Arbess, 2003). However, community population studies report

a prevalence of 15% for male participants with AN (Garfinkel et al., 1996) and 8–10% for male participants with BN (Garfinkel et al., 1995). Recently, an increasing rate of male ED has also been observed in Spain (Fernández-Aranda & Jiménez-Murcia, 2009; Rodríguez-Cano, Beato-Fernández, & Belmonte-Llario, 2005) and other European countries (Kjelsås et al., 2004).

In general, studies have indicated that the clinical manifestations of male participants with ED are similar to the one of female eating disorder participants in terms of age of onset, weight control methods and associated eating disorder factors (Braun, Sunday, Huang, & Halmi, 1999; Carlat et al., 1997; Fernández-Aranda et al., 2004; Keel, Klump, Leon, & Fulkerson, 1998;

Olivardia, Pope, Mangweth, & Hudson, 1995). However, some gender differences in clinical characteristics and risk factors have been noted (Andersen & Mickalide, 1985; Deter, Köpp, Zipfel, & Herzog, 1998; Woodside et al., 2001) including sexual orientation (Andersen & Holman, 1997; Bramon-Bosch, Troop, & Treasure, 2000; Carlat et al., 1997; Russell & Keel, 2002; Schneider, 1995), adverse childhood experiences (Kinzl, Mangweth, Traweger, & Biebl, 1997) and premorbid obesity (Sharp, Clark, Dunan, Blackwood, & Shapiro, 1994). Furthermore, gender differences in eating disorder participants have been reported in terms of eating disorder symptomatology (Charles & Anderson, 2004), general psychopathology (Bramon-Bosch et al., 2000) and personality (Fernández-Aranda et al., 2004), all of which will be explained in more detail in the following paragraphs.

### Eating disorder symptomatology in male eating disorders

In male ED, physical activity is more pronounced than in female participants (Lewinsohn, Seeley, Moerk, & Striegel-Moore, 2002; Spann & Pritchard, 2008), whereas laxatives are used less (Braun et al., 1999; Button et al., 2008; DiGiacchino, Sargent, Sharpe, & Miller, 1999; Fichter, 1985). Male participants also have a later age of onset than female participants (Bramon-Bosch et al., 2000; Braun et al., 1999; Grabhorn, Köpp, Gitzinger, von Wietersheim, & Kaufhold, 2003). Furthermore, male participants have been found to show less concern about body dissatisfaction and drive for thinness than female participants. This has been shown in both clinical ED (Joiner, Katz, & Heatherton, 2000; Kjelsås, Augestad, & Flanders, 2003) and general population samples (Behar, de la Barrera, & Michelotti, 2002; Davis & Katzman, 1998; Geist, Heinmaa, Katzman, & Stephens, 1999; Lewinsohn et al., 2002).

### General psychopathology in male eating disorders

Male participants with ED have more general psychopathology and comorbidity than female ED (Bean, Maddocks, Timmel, & Weltzin, 2005). In several comparison studies, male ED have higher rates of depression and substance abuse (Striegel-Moore, Garvin, Dohm, & Rosenheck, 1999b) and higher levels of Axis I (Weltzin et al., 2007) or Axis II (Striegel-Moore et al., 1999a) comorbidity than female participants with ED. Conversely, other studies have failed to find gender differences in comorbid psychopathology (Woodside et al., 2001). Further research is therefore required to disentangle these contradictory findings.

### Personality in male eating disorders

The few studies assessing personality in men with ED have shown inconsistent findings. Although some studies revealed lower levels of harm avoidance, reward dependence, cooperativeness and higher scores on novelty seeking in male participants than female participants with AN (Fassino, Daga, Pierò, Leombruni, & Rovera, 2001; Woodside et al., 2004), other studies indicated a higher level of perfectionism and interpersonal distrust in male participants (Behar et al., 2002; Joiner et al., 2000).

Taken together, there is evidence that there are gender-specific differences in eating disorder participants in terms of eating disorder symptomatology, general psychopathology and personality. However, most studies include small sample sizes, sometimes

with a lack of a control group and insufficient information on the methodology employed. To improve on these earlier designs, the present study set out to examine differences across male and female eating disorder participants by employing a wide range of psychometric measures in a large sample of consecutive male eating disorder referrals in Spain.

### Aims of the study

The main goals of this study are twofold as follows: a) to determine if male and female eating disorder participants differ in terms of clinical features, associated psychopathology and personality traits when compared with a healthy comparison group; and b) to assess whether there are gender-specific differences among eating disorder subtypes [AN, BN and eating disorder not otherwise specified (EDNOS)] and controls on these measures.

We hypothesized that male eating disorder participants would exhibit lower body image concerns and drive for thinness than female eating disorder participants and that there would be gender-specific differences on personality traits (related to some traits such as harm avoidance or cooperativeness).

## Methods

### Participants

The present study employed a case-control design. Entry into the study was between January 2002 and 2006. The total sample comprised 240 participants as follows: an eating disorder group (60 male and 60 female participants) and a healthy comparison group (60 male and 60 female participants).

The Ethics Committee of our institution approved this study, and informed consent was obtained from all participants.

### Eating disorder participants

The psychiatric cohort (the case group) included 60 male eating disorder participants, diagnosed according to the criteria of the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (American Psychiatric Association, 2000) [AN ( $n=10$ ), BN ( $n=25$ ) and EDNOS ( $n=25$ )] and who had consecutively attended our outpatient unit. This group was compared with 60 female eating disorder participants matched by means of a pairwise matching procedure, using SPSS program (SPSS Inc., Chicago, IL, USA), in terms of age, diagnosis and duration of the disorder. Each case of the male eating disorder group ( $N=60$ ) was paired to a randomly selected female eating disorder participant ( $N=60$ ) from a larger pool of 742 female eating disorder cases using propensity scores.

All participants were diagnosed by means of a semi-structured clinical interview (First, Spitzer, Gibbon, & Williams, 2002) conducted by experienced psychologists and psychiatrists.

### Healthy controls

The healthy control comparison group, recruited from student volunteers and participants visiting the hospital for routine blood test, was composed of 60 male and 60 female participants. All controls were from the same catchment areas as index patient. The exclusion criteria for the control group were the following: (a) current psychiatric disturbances, screened by the General Health Questionnaire (Goldberg, 1981) and (b) lifetime ED,

according to the criteria of the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (American Psychiatric Association, 2000). From the initial sample of 134 controls, the following were excluded: (1) participants who had a lifetime ED ( $n=4$ ) and (2) participants with a current mental illness ( $n=10$ ).

### Assessment

We developed a comprehensive battery of assessments to quantify eating disorder symptoms, general psychopathology and personality. The battery included the Eating Disorder Inventory—2 (EDI-2; Garner, 1991), Symptom Checklist—Revised (SCL-90-R; Derogatis, 1990), Temperament and Character Inventory—Revised (TCI-R; Cloninger, 1999) and a structured clinical interview (Fernández-Aranda & Turón, 1998) evaluating sociodemographic and clinical variables.

#### Eating Disorder Inventory—2 (Garner, 1991)

The EDI-2 (Garner, 1991) is a reliable and valid 91-item multidimensional self-report questionnaire that assesses different cognitive and behavioural characteristics, which are typical for ED. The EDI-2 (Garner, 1998) retains the 64 items (grouped into the following eight scales: drive for thinness, bulimia, body dissatisfaction, ineffectiveness, perfectionism, interpersonal distrust, interoceptive awareness and maturity fears) of the EDI and adds 27 new items into three provisional scales as follows: asceticism, impulse regulation and social insecurity. All of these scales are answered on a six-point Likert scale and provide standardized subscale scores. This instrument was validated in a Spanish population (Garner, 1998) with a mean internal consistency of 0.63 (Cronbach's  $\alpha$ ).

#### Symptom Checklist—Revised (Derogatis, 1990)

In order to evaluate a broad range of psychological problems and symptoms of psychopathology, the SCL-90-R (Derogatis, 1990) was employed. This test contains 90 items and helps to measure nine primary symptom dimensions, which are the following: somatization, obsession-compulsion, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation and psychoticism. In addition, it includes three global indices, which are the following: a global severity index (GSI), designed to measure overall psychological distress; a positive symptom distress index, intended to measure the intensity of symptoms; and a positive symptom total, which assesses self-reported symptoms. The GSI can be used as a summary of the test. This scale has been validated in a Spanish population (Derogatis, 2002), obtaining a mean internal consistency of 0.75 (Cronbach's  $\alpha$ ).

#### Temperament and Character Inventory—Revised (Cloninger 1999)

The TCI-R (Cloninger, 1999) is a 240-item, five-point Likert scale, reliable and valid questionnaire that measures, as in the original TCI version (Cloninger, Svrakic, & Przybeck, 1993), seven dimensions of personality as follows: four temperament (harm avoidance, novelty seeking, reward dependence and persistence) and three character dimensions (self-directedness, cooperativeness and self-transcendence). Performances on the Spanish version of the original questionnaire (Gutiérrez et al., 2001) and

the revised version (Gutiérrez-Zotes et al., 2004) have been documented. The scales in the latter have shown an internal consistency of 0.87 (Cronbach's  $\alpha$ ).

### Evaluation of sociodemographics and clinical variables

Additional sociodemographic information including age, marital status, education, occupation, living arrangements, motivation to receive treatment, parental occupation and clinical relevant variables regarding the participants' ED and psychopathological symptoms were assessed by a structured clinical interview (Fernández-Aranda & Turón, 1998).

### Procedure

Upon presentation at the eating disorder unit (secondary and tertiary care unit), three experienced psychologists with master's or doctoral degrees conducted a 2-hour semi-structured face to face interview to measure eating disorder symptoms and psychopathological traits (Fernández-Aranda & Turón, 1998), which is part of the assessment of all patients attending the eating disorder unit. In addition to this comprehensive clinical and psychological evaluation (including the instruments mentioned above), further demographic information was obtained.

### Statistical analysis

The PASW 17 program (SPSS system, SPSS Inc., Chicago, IL, USA) was used in the statistical analyses. Firstly, differences across genders for the sociodemographic and clinical variables were compared separately for the total sample, the eating disorder participants and the controls through *t*-test procedures for quantitative measures and chi-squared analyses for categorical variables. Secondly, we explored differences in the clinical variables because of gender (male–female) and diagnosis (case–control) through a  $2 \times 2$  analysis of variance procedures [analysis of variance (ANOVA), using the general linear model] adjusted by participant's age. For the gender comparison stratified by eating disorder subdiagnosis, Mann–Whitney *U*-tests were used. The  $\alpha$  level of significance for symptomatology [EDI-2 and body mass index (BMI)], comorbid psychopathology (SCL-90-R) and personality (TCI-R) comparisons was established at 0.002. Many studies indicate that ANOVA is robust to moderate violations of normality when sample sizes for each group are not unreasonably small ( $n < 5$ ) (Driscoll, 1996; Markowski & Markowski, 1990). The data were checked to assure that nonrelevant deviations from normality emerged and that samples sizes guaranteed the absence of bias due to this condition.

## Results

### Sociodemographics

The mean age of the total sample was 24.0 ( $SD=5.6$ ) [cases:  $M=21.0$  ( $SD=5.2$ ); controls:  $M=24.0$  ( $SD=5.9$ );  $p=0.912$ ]. The majority of the participants were single (87.3%) and had completed high school (68.7%). Approximately 52.4% of the participants were employed. In the total sample, there were no gender differences for marital status and education. However, in the control group, significant gender differences were revealed for age [male participants:  $M=26.2$  ( $SD=5.7$ ); female participants:  $M=21.9$  ( $SD=5.3$ );  $p < 0.001$ ]. Therefore, the remaining statistical

analyses were adjusted for age. In the eating disorder group, no gender differences were obtained for age.

### Clinical features

The mean age of onset of the ED was 18.6 years ( $SD=4.1$ ) and the mean duration of the disorder was 4.8 years ( $SD=3.7$ ). The mean number of previous treatments was 0.8 ( $SD=1.0$ ), ranging from 0 to 5. Participants reported a weekly average of 4.0 binge-eating episodes ( $SD=6.8$ ), 4.6 vomiting episodes ( $SD=7.8$ ), 2.9 laxative-use episodes ( $SD=9.8$ ) and 0.7 diuretic-use episodes ( $SD=4.4$ ). The mean BMI at assessment was 22.8 kg/m<sup>2</sup> ( $SD=5.9$ ).

The only variables where male and female ED differed were weekly frequency of vomiting and laxative use. Male eating disorder participants reported a higher mean number of weekly vomits (6.4 vs. 2.9;  $p=0.019$ ) and a lower mean frequency of laxative use (0.7 vs. 5.0;  $p=0.020$ ) than women. When different eating disorder subtypes were assessed, male BN participants were found to report a higher frequency of vomiting episodes (mean weekly frequency: 10.9 vs. 4.9, respectively;  $p=0.049$ ) and lower laxative use than female participants (mean weekly frequency: 1.0 vs. 5.5, respectively;  $p=0.018$ ). Finally, male EDNOS participants exhibited a significantly lower number of previous treatments (0.4 vs. 1.20, respectively;  $p=0.002$ ) and a higher age of onset than female EDNOS participants (20.0 vs. 17.2, respectively;  $p=0.013$ ).

### Male participants and eating disorder symptomatology

Table 1 contains the results of the ANOVA procedures for eating disorder symptomatology across genders for eating disorder

participants and healthy controls adjusted by age, whereas Table 2 shows the gender comparisons across eating disorder subtypes (AN, BN and EDNOS). Because no interaction sex by diagnosis was statistically significant ( $p>0.002$ ), only the main effects were tabulated and interpreted. As expected, eating disorder cases obtained higher mean scores in all measures, except for current BMI and the EDI-2 perfectionism scale, where eating disorder participants and controls reported statistically equal scores. Regarding differences because of gender, men ED had a higher maximum BMI and lower means in the EDI-2 drive for thinness and body dissatisfaction scales than female ED; a similar trend was also observed in the control sample.

When the eating disorder subtype was considered, differences across genders were only found in the EDNOS group. That is, male participants showed higher current BMI values and lower EDI-2 body dissatisfaction scale scores than female participants.

### Male participants and comorbid psychopathology and personality

Table 3 presents the results for the differences in comorbid psychopathology and personality between eating disorder participants and healthy controls. No interaction effect (gender  $\times$  group) was observed ( $p>0.002$ ). Significant differences between cases and controls were observed for all SCL-90-R scales and for TCI-R harm avoidance and self-directedness scales. In addition, various gender differences were also obtained. As regard to general psychopathology, men reported significantly lower scores on the following SCL-90-R scales: somatisation, interpersonal sensitivity, depression, anxiety, GSI and positive symptom total. In

**Table 1** Comparison of eating disorder symptomatology measures by gender and eating disorder cohort

	Mean and standard deviations: comparison for control-ED				Mean differences (ANOVA)	
	Controls		Cases		Main effects	
	Male (N=60)	Female (N=60)	Male (N=60)	Female (N=60)	Sex <sup>†</sup>	Diagnose <sup>‡</sup>
BMI						
Baseline	23.89 (3.34)	20.97 (2.57)	22.77 (5.19)	22.80 (6.53)	-1.0 (-2.2; 0.3)	0.3 (-0.9; 1.5)
Maximum	25.95 (4.51)	22.29 (3.17)	28.21 (6.64)	26.03 (5.87)	-2.3 (-3.6; -0.9)*	2.9 (1.6; 4.3)*
Minimum	21.66 (2.63)	19.32 (2.29)	19.37 (4.25)	18.91 (3.25)	-1.2 (-2.0; -0.3)	-1.4 (-2.2; -0.5)*
EDI-2						
Drive for thinness	1.90 (3.20)	5.08 (6.36)	9.26 (6.37)	13.48 (5.88)	3.8 (2.2; 5.3)*	7.9 (6.3; 9.4)*
Body dissatisfaction	2.88 (3.19)	6.75 (7.18)	10.90 (7.75)	16.70 (7.29)	4.9 (3.0; 6.8)*	9.0 (7.2; 10.8)*
Interceptive awareness	1.43 (2.21)	2.42 (3.27)	7.53 (6.71)	11.35 (6.35)	2.2 (0.8; 3.7)	7.5 (6.1; 8.9)*
Bulimia	0.59 (1.50)	0.83 (1.53)	5.05 (5.54)	6.40 (5.67)	1.0 (-0.2; 2.2)	5.0 (3.9; 6.2)*
Interpersonal distrust	2.84 (3.23)	2.15 (2.42)	6.10 (4.46)	5.97 (4.30)	-0.6 (-1.7; 0.4)	3.6 (2.5; 4.6)*
Ineffectiveness	1.59 (2.39)	2.08 (3.17)	8.51 (7.04)	11.87 (6.88)	1.8 (0.2; 3.3)	8.3 (6.9; 9.8)*
Maturity fears	4.45 (4.42)	5.04 (3.86)	9.36 (6.28)	8.45 (5.16)	-0.5 (-1.9; 0.9)	4.2 (2.8; 5.5)*
Perfectionism	4.16 (3.92)	3.42 (3.00)	4.51 (4.42)	6.03 (4.85)	0.2 (-0.9; 1.4)	1.5 (0.4; 2.6)
Impulsivity	1.76 (3.17)	1.77 (2.54)	6.32 (7.22)	8.33 (6.08)	0.5 (-0.9; 2.0)	5.6 (4.2; 7.0)*
Asceticism	2.41 (3.06)	1.92 (1.99)	6.19 (4.96)	6.97 (4.33)	0.2 (-0.9; 1.3)	4.4 (3.4; 5.5)*
Social insecurity	2.57 (3.09)	2.35 (2.83)	7.27 (5.51)	8.42 (5.27)	0.4 (-0.9; 1.6)	5.4 (4.2; 6.6)*
Total	26.6 (20.8)	33.8 (25.5)	81.4 (50.4)	103.9 (41.5)	13.5 (3.0; 24.0)	62.4 (52.3; 72.6)*

ED, eating disorders; ANOVA, analysis of variance; BMI, body mass index; EDI-2, Eating Disorder Inventory—2.

<sup>†</sup>Sex factor: difference obtained for female-male participants.

<sup>‡</sup>Diagnose factor: difference obtained for cases-controls.

\*The parameter is significant at 0.002 level.



**Table 2** Comparison of eating disorder symptomatology measures by gender and eating disorder subtype

	Mean and standard deviations: comparison for eating disorder subtypes					
	AN		BN		EDNOS	
	Male (n=10)	Female (n=10)	Male (n=25)	Female (n=25)	Male (n=25)	Female (n=25)
<b>BMI</b>						
Baseline	17.6 (2.3)	16.5 (0.9)	23.4 (3.5)	27.1 (5.4)	<b>24.1 (6.1)</b>	<b>21.0 (6.1)</b>
Maximum	22.9 (4.6)	22.4 (2.0)	29.5 (5.2)	29.5 (5.0)	29.0 (7.5)	24.1 (6.1)
Minimum	16.1 (2.2)	15.6 (0.9)	19.2 (4.4)	21.2 (2.4)	20.8 (4.1)	18.0 (2.9)
<b>EDI-2</b>						
Drive for thinness	6.9 (7.0)	11.9 (7.0)	10.8 (6.2)	14.5 (5.2)	8.6 (6.1)	13.1 (6.1)
Body dissatisfaction	7.7 (4.9)	10.4 (5.6)	13.2 (8.8)	18.9 (6.8)	<b>9.9 (7.0)</b>	<b>17.0 (7.1)</b>
Interoceptive awareness	5.2 (4.7)	10.1 (6.0)	10.0 (7.5)	12.0 (6.6)	5.9 (5.9)	11.2 (6.4)
Bulimia	3.2 (3.2)	2.5 (3.2)	8.5 (6.3)	9.3 (4.5)	2.2 (2.9)	5.0 (6.1)
Interpersonal distrust	4.5 (3.4)	4.1 (2.8)	6.9 (3.7)	6.1 (4.5)	5.9 (5.5)	6.6 (4.5)
Ineffectiveness	4.3 (3.0)	9.8 (6.3)	11.2 (7.7)	11.6 (7.4)	7.5 (6.5)	13.0 (6.6)
Maturity fears	7.4 (4.5)	7.5 (5.5)	11.2 (6.4)	7.8 (4.5)	8.3 (6.5)	9.4 (5.7)
Perfectionism	1.6 (1.6)	3.8 (3.6)	6.0 (4.7)	6.2 (5.1)	4.1 (4.3)	6.8 (5.0)
Impulsivity	2.5 (2.5)	4.8 (5.0)	9.0 (7.8)	9.5 (5.2)	5.1 (7.0)	8.6 (6.9)
Asceticism	4.3 (2.6)	5.6 (3.9)	8.0 (5.8)	7.6 (4.1)	5.1 (4.3)	6.9 (4.7)
Social insecurity	5.5 (3.1)	5.0 (3.7)	8.6 (5.7)	8.5 (5.2)	6.6 (6.0)	9.7 (5.4)
Total	53.1 (19.8)	75.5 (33.2)	103.5 (51.1)	112.0 (39.0)	69.8 (50.2)	107.3 (43.5)

In bold: significant differences by gender with each eating disorder subtype ( $p \leq 0.002$ ), Mann–Whitney procedure.

AN, anorexia nervosa; BN, bulimia nervosa; EDNOS, eating disorder not otherwise specified; BMI, body mass index; EDI-2, Eating Disorder Inventory—2.

**Table 3** Comparison of general psychopathology and personality by gender and eating disorder cohort

	Mean and standard deviations: comparison for control–ED				Mean differences (ANOVA)	
	Controls		Cases		Main effects	
	Male (N=60)	Female (N=60)	Male (N=60)	Female (N=60)	Sex <sup>†</sup>	Diagnose <sup>‡</sup>
<b>SCL-90-R</b>						
Somatization	0.54 (0.48)	0.80 (0.61)	1.29 (0.91)	1.75 (0.99)	0.4 (0.1; 0.6)*	0.8 (0.6; 1.0)*
Obsessive–compulsive	0.76 (0.51)	0.86 (0.58)	1.57 (0.98)	1.90 (0.96)	0.2 (0.0; 0.4)	0.9 (0.7; 1.1)*
Interpersonal sensitivity	0.61 (0.61)	0.88 (0.71)	1.59 (0.99)	2.12 (0.91)	0.4 (0.2; 0.6)*	1.1 (0.9; 1.3)*
Depression	0.55 (0.50)	0.85 (0.64)	1.72 (1.00)	2.33 (0.79)	0.5 (0.3; 0.7)*	1.3 (1.1; 1.5)*
Anxiety	0.47 (0.44)	0.70 (0.53)	1.27 (0.81)	1.86 (0.95)	0.4 (0.2; 0.6)*	1.0 (0.8; 1.2)*
Hostility	0.51 (0.61)	0.63 (0.67)	1.22 (0.91)	1.61 (0.98)	0.2 (0.0; 0.4)	0.8 (0.6; 1.0)*
Phobic anxiety	0.20 (0.38)	0.32 (0.46)	0.80 (0.87)	1.17 (0.93)	0.2 (0.0; 0.4)	0.7 (0.5; 0.9)*
Paranoid ideation	0.68 (0.77)	0.80 (0.63)	1.39 (1.03)	1.57 (0.96)	0.1 (−0.1; 0.3)	0.7 (0.5; 1.0)*
Psychoticism	0.38 (0.44)	0.44 (0.49)	1.12 (0.83)	1.34 (0.77)	0.1 (−0.1; 0.3)	0.8 (0.7; 1.0)*
GSI	0.54 (0.41)	0.76 (0.55)	1.38 (0.81)	1.81 (0.76)	0.3 (0.1; 0.5)*	0.9 (0.8; 1.1)*
PSDI	1.44 (0.39)	1.48 (0.42)	2.11 (0.65)	2.42 (0.53)	0.2 (0.0; 0.3)	0.8 (0.7; 0.9)*
PST	30.3 (17.9)	39.9 (20.9)	55.2 (22.1)	66.0 (20.0)	9.3 (4.0; 14.6)*	24.9 (19.7;30.1)*
<b>TCI-R</b>						
Novelty seeking	104.3 (14.8)	102.2 (14.8)	103.4 (15.4)	103.3 (12.3)	−1.2 (−5.0; 2.6)	0.0 (−3.7; 3.7)
Harm avoidance	92.1 (17.1)	98.8 (13.8)	108.1 (20.9)	120.3 (20.5)	9.5 (4.6; 14.4)*	18.9 (14.2;23.7)*
Reward dependence	100.8 (13.1)	110.0 (13.5)	99.1 (17.3)	103.6 (17.6)	6.7 (2.6; 10.9)*	−4.1 (−8.2; −0.1)
Persistence	111.2 (18.6)	108.3 (17.1)	103.4 (22.9)	113.1 (21.4)	3.8 (−1.5; 9.2)	−1.5 (−6.6; 3.7)
Self-directedness	141.8 (20.4)	143.0 (14.9)	122.4 (22.4)	112.3 (23.2)	−3.8 (−9.2; 1.7)	−25.0 (−31; −20)*
Cooperativeness	131.7 (18.5)	140.2 (11.5)	128.8 (19.5)	136.3 (17.6)	8.1 (3.5; 12.6)*	−3.5 (−7.9; 0.9)
Self-transcendence	60.5 (13.7)	65.5 (13.3)	64.0 (15.4)	68.2 (16.1)	4.9 (1.0; 8.8)	3.0 (−0.8; 6.8)

ED, eating disorders; ANOVA, analysis of variance; SCL-90-R, Symptom Checklist—Revised; GSI, global severity index; PSDI, positive symptom distress index; PST, positive symptom total; TCI-R, Temperament and Character Inventory—Revised.

<sup>†</sup>Sex factor: difference obtained for female–male participants.

<sup>‡</sup>Diagnose factor: difference obtained for cases–controls.

\*The parameter is significant at 0.002 level.

terms of personality traits, significant differences across genders were found for harm avoidance, reward dependence and cooperativeness with the men scoring significantly lower than the female participants on these measures.

When differences in SCL-90-R scores were assessed across eating disorder subtypes, significant differences were only obtained for the EDNOS group, with the male participants scoring higher than the female participants on depression, anxiety, GSI and positive symptom distress index. Conversely, male EDNOS participants had lower scores than women on SCL-90-R phobic anxiety scale (Table 4). Significant differences in personality traits with regard to gender were also obtained across eating disorder subtypes. That is, male EDNOS participants scored significantly lower than female participants on self-directedness.

## Discussion

This is the first study using a large sample of male eating disorder participants when compared with female eating disorder participants and a large healthy control group. Moreover, the present study assessed gender differences in diverse eating disorder subgroups, which has not been previously attempted. Overall, there were many similarities between male and female eating disorder participants. However, there were gender differences in compensatory behaviours. That is, male participants had a higher frequency of vomiting episodes but less laxative abuse than women. Furthermore, compared with female eating disorder

participants, we found that in general terms, male participants with ED were less pre-occupied with thinness, exhibited lower general psychopathology and revealed lower scores on the following TCI-R traits: harm avoidance, reward dependence and cooperativeness.

## Male participants and eating disorder symptomatology

Our results are in line with some previous studies that have shown that male participants were less likely to use laxatives as a weight control method than female ED (Braun et al., 1999; Button et al., 2008; DiGiacchino et al., 1999) but contradict other studies which have failed to find different weight control strategies (Bramon-Bosch et al., 2000; Braun et al., 1999; Carlat et al., 1997; Fernández-Aranda et al., 2004; Keel et al., 1998; Olivardia et al., 1995). Curiously, and not in concordance with the prior literature (Bramon-Bosch et al., 2000; Ross & Ivis, 1999), in our study, male participants reported a higher frequency of vomiting episodes than female ED. This is consistent with a recent review (Ricciardelli, McCabe, Williams, & Thompson, 2007) that has indicated that Hispanic male participants reported more weight loss behaviours than non-Hispanic male participants, suggesting cultural differences in extreme weight loss strategies. One possible explanation for these observed differences is that male participants may be less informed about ED and compensatory behaviours than female participants (Fernández-Aranda et al., 2004).

The lower body image concerns and drive for thinness results agree with the findings of previous studies conducted with clinical

**Table 4** Comparison of general psychopathology and personality by gender and eating disorder subtype

	Mean and standard deviations: comparison for eating disorder subtypes					
	AN		BN		EDNOS	
	Male ( <i>n</i> =10)	Female ( <i>n</i> =10)	Male ( <i>n</i> =25)	Female ( <i>n</i> =25)	Male ( <i>n</i> =25)	Female ( <i>n</i> =25)
SCL-90-R						
Somatization	1.0 (0.6)	1.7 (1.0)	1.0 (0.8)	1.3 (0.6)	1.9 (1.1)	1.7 (1.0)
Obsessive-compulsive	1.3 (0.8)	1.9 (1.0)	1.3 (0.9)	1.6 (0.8)	2.1 (0.9)	1.8 (1.0)
Interpersonal sensitivity	1.3 (0.8)	1.9 (0.9)	1.4 (1.1)	1.6 (0.7)	2.3 (0.9)	2.2 (1.0)
Depression	1.7 (0.9)	2.1 (0.9)	1.3 (1.0)	2.1 (0.8)	<b>2.5 (0.8)</b>	<b>2.3 (0.8)</b>
Anxiety	1.1 (0.6)	1.6 (0.8)	1.0 (0.8)	1.3 (0.9)	<b>2.1 (1.0)</b>	<b>1.9 (0.9)</b>
Hostility	0.9 (0.8)	1.5 (0.9)	1.0 (0.9)	1.2 (1.0)	1.7 (1.0)	1.7 (0.9)
Phobic anxiety	0.6 (0.7)	1.1 (0.9)	0.6 (0.8)	0.7 (0.7)	<b>1.2 (1.0)</b>	<b>1.3 (0.9)</b>
Paranoid ideation	1.0 (0.9)	1.7 (1.1)	1.3 (1.0)	1.1 (0.6)	1.7 (0.9)	1.6 (1.1)
Psychoticism	0.9 (0.7)	1.4 (0.8)	0.9 (0.8)	1.1 (0.8)	1.4 (0.7)	1.3 (0.8)
GSI	1.1 (0.6)	1.7 (0.8)	1.1 (0.8)	1.4 (0.6)	<b>2.0 (0.7)</b>	<b>1.8 (0.8)</b>
PSDI	2.0 (0.5)	2.4 (0.6)	1.8 (0.6)	2.2 (0.5)	<b>2.5 (0.5)</b>	<b>2.4 (0.5)</b>
PST	49.0 (19.7)	63.4 (20.2)	49.6 (23.0)	58.7 (23.2)	66.6 (18.0)	66.1 (20.8)
TCI-R						
Novelty seeking	93.0 (12.2)	106.8 (14.8)	104.3 (15.8)	97.9 (10.5)	105.6 (11.7)	103.1 (13.3)
Harm avoidance	102.0 (21.1)	114.9 (18.9)	103.6 (21.6)	111.7 (15.9)	121.3 (22.4)	122.9 (20.0)
Reward dependence	97.0 (16.6)	98.4 (16.7)	100.8 (18.7)	105.6 (15.0)	102.4 (17.1)	104.0 (19.7)
Persistence	103.6 (14.5)	102.4 (29.4)	104.4 (18.2)	114.1 (17.0)	110.7 (25.4)	115.1 (18.9)
Self-directedness	130.1 (18.9)	110.7 (19.9)	131.7 (21.2)	115.9 (45.9)	<b>110.8 (18.6)</b>	<b>112.6 (15.7)</b>
Cooperativeness	132.4 (21.5)	124.7 (18.0)	131.5 (20.1)	140.1 (13.1)	135.4 (20.2)	136.0 (16.6)
Self-transcendence	62.2 (12.9)	68.8 (17.4)	59.7 (13.0)	68.4 (13.0)	73.2 (17.2)	63.1 (15.0)

In bold: significant differences by gender ( $p \leq 0.002$ ), Mann-Whitney procedure.

AN, anorexia nervosa; BN, bulimia nervosa; EDNOS, eating disorder not otherwise specified; SCL-90-R, Symptom Checklist—Revised; GSI, global severity index; PSDI, positive symptom distress index; PST, positive symptom total; TCI-R, Temperament and Character Inventory—Revised.

(Barry & Garner, 2001; Fernández-Aranda et al., 2004; Joiner et al., 2000; Kjelsås et al., 2003) and general populations (Sepúlveda, Carrobes, & Gandarillas, 2008; Striegel-Moore et al., 2009; Thianthai, 2008) and may reflect sociocultural gender differences, as a similar differential pattern was found in the healthy comparison group. Hence, in line with our clinical experience and the findings of other authors (Benninghoven, Raykowski, Solzbacher, Kunzendorf, & Jantschek, 2007; Fernández-Aranda et al., 2004; Gila, Castro, Cesena, & Toro, 2005; Weltzin et al., 2005), one explanation for these findings might be that male participants are more concerned about their body shape in terms of muscularity, whereas women are more pre-occupied with being thin.

### Male participants and personality

The lower scores on harm avoidance, reward dependence and cooperativeness is consistent with previous clinical (Fassino et al., 2001a; Woodside et al., 2004) and general populations studies (Brändström, Richter, & Przybeck, 2001; Lask & Bryant-Waugh, 2000; Miettunen, Veijola, Lauronen, Kantojärvi, & Joukamaa, 2007). The previous literature suggested that female participants might have scored higher in these scales due to either a real gender bias, a sampling error or even due to some characteristics of the items in the questionnaires, which might be more salient for female participants than for male participants (Stewart, Ebmeier, & Deary, 2004). The questions on harm avoidance, for instance, may be more appropriate for female participants than for male participants in that it is easier for female participants to cry, whereas male participants might be more likely to express anger (Jorm, 1987). Interestingly, these gender differences have also been reported in other cultures and languages (Gutiérrez-Zotes et al., 2004).

### Limitations of the present study

The present study has some limitations. First, the retrospective and self-report data collection procedures may limit the validity and the reliability of our findings. Second, the cross-sectional design does not allow us to determine causality of the variables assessed. Third, it should be noted that because our eating disorder sample was derived from a specialized eating disorder treatment centre, our findings might be slightly inflated due to the increasing comorbidity and symptom severity in this group. Fourth, the eating and shape concepts in the questionnaires may have different meanings across gender; for example, body image concerns may differ [e.g. men are more likely to desire a more muscular body, rather than thinness (see Weltzin et al., 2005)] and it is possible that these need further validation in male

participants with ED. Unfortunately, such an investigation was beyond our resource. Conversely, even though the prevalence rate of ED is low especially in male participants, a specific strength of the present paper was that we were able to analyse a large clinical and control group composed of both male and female participants.

### Clinical implications

Most studies suggest that given the clinical similarities, similar treatment strategies are appropriate for male and female eating disorder participants (Braun et al., 1999; Carlat et al., 1997; Muise et al., 2003). However, others have argued that interpersonal treatments may be more effective for male participants (Johnson et al., 2003; Muise et al., 2003). Our findings suggest that a differential type of focus on body image and nutritional factors may be needed.

### Conclusions

In conclusion, although there are many similarities between male and female eating disorder participants, there are also differences in compensatory behaviours (less laxative use and more vomiting in male participants with ED) and body image concerns that do not relate to thinness. Furthermore, male ED obtained lower values than female ED on harm avoidance, reward dependence and cooperativeness, although these appeared to be more related to gender differences in general than to ED per se. Further studies on the needs of male participants and longitudinal studies analysing risk factors will be of value.

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