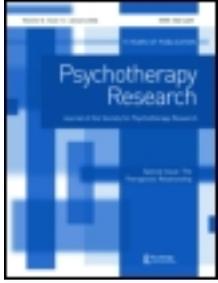


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## Comparison study of full and subthreshold bulimia nervosa: Personality, clinical characteristics, and short-term response to therapy

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### Abstract

This study compared symptomatological and personality differences between individuals with threshold bulimia nervosa (BN;  $n = 39$ ) and those with subthreshold BN ( $n = 39$ ) and their short-term response to a brief outpatient intervention. Participants were matched using a pairwise matching procedure, taking into account age, age of onset, and duration of the disorder. Both groups received the same brief outpatient psychoeducational therapy. The same assessment measures were used before and after treatment. With the exception of some clinical and psychopathological symptoms (higher depression and phobic anxiety in threshold BN), there were no significant between-group differences on scales of general psychopathology or personality traits. At the end of treatment, there were no significant between-group differences on abstinence rates for binge eating and vomiting, number of sessions attended, or dropout rates. Threshold BN and subthreshold BN share common psychopathological symptoms and personality traits. No differences in therapy outcome were observed for the two groups after a brief group psychoeducational intervention.

The point prevalence of threshold bulimia nervosa (BN) has been estimated to be between 3% and 7% in young female general practice attendees and from 0.5% to 1.0% in community samples (Bushnell, Wells, Hornblow, Oakley-Browne, & Joyce, 1990; Hoek & van Hoeken, 2003). Despite the prevalence and associated medical and psychiatric morbidity, only a small proportion of individuals with BN seek treatment (Arnow, 1999; Hudson, Hiripi, Pope, & Kessler, 2006). This mismatch between prevalence and treatment seeking may be due in part to difficulties in finding specialized treatment settings for BN and the high costs and logistics associated with face-to-face individual psychotherapy (King, 1989).

### Threshold Versus Subthreshold BN Cases

Subthreshold BN (sub-BN) is more common than full, threshold, BN (Hoek, 1993; Wade, Bergin,

Tiggemann, Bulik, & Fairburn, 2006). People with sub-BN generally exhibit eating disorders of clinical severity but do not meet criteria for full BN. Technically, individuals with sub-BN are considered to have eating disorder not otherwise specified (EDNOS) (American Psychiatric Association [APA], 2000a). Although EDNOS is a residual diagnostic category, strikingly, the majority of individuals seeking treatment for an eating disorder (25–60%) fall into this category (Anderson, Bowers, & Watson, 2001; Grilo, Devlin, Cachelin, & Yanovski, 1997; Rodriguez-Cano, Beato-Fernández, & Belmonte-Llario, 2005). Arguments exist for removing sub-BN from the EDNOS category and placing it under the BN diagnostic heading. This could be accomplished either by relaxing the diagnostic criteria for BN or by introducing a severity index (Fairburn & Bohn, 2005). Further research is needed to determine the optimal approach to classification and subclassification of

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eating disorders. The present study contributes to this literature by exploring differences in response to a brief group psychoeducation intervention in individuals with threshold and sub-BN.

### **Personality Differences between Threshold and Subthreshold Bulimia Nervosa**

An important dimension to consider when studying outcome in eating disorders is underlying personality traits (Wagner et al., 2006). Bulimic patients are generally characterized by high impulsivity, sensation seeking, and novelty seeking (Fernández-Aranda et al., 2006). It remains unclear whether differences in these traits between patients with BN and recovered individuals are factors that add to an unfavorable outcome or are a result of malnutrition augmenting the symptoms (Klump et al., 2004). Research on this topic has yielded contradictory findings. Some studies indicate that a wide range of common eating disorder symptoms continue after recovery and do not differ between eating disorder subtypes, suggesting that they are traits rather than state-related disturbances. (Klump et al., 2004; Wagner et al., 2006). Other studies have shown that recovery from eating disorders may have an attenuating influence on the symptoms of personality disorders (Marino & Zanarini, 2001; Matsunaga et al., 2000). Additional focused research is, therefore, required to clarify these inconsistencies.

### **Efficacy of Face-to-Face Individual Psychotherapy for Full and Subthreshold Bulimia Nervosa**

Causal and maintenance factors of BN have been conceptualized from several theoretical perspectives. Cognitive-behavioral therapy (CBT), based on the cognitive model postulated by Fairburn et al. (Fairburn, 1997; Fairburn, Marcus, & Wilson, 1993a), is considered to be the psychotherapeutic treatment of choice supported by its good outcomes in randomized controlled trials (Agras, Walsh, Fairburn, Wilson, & Kraemer, 2000). CBT has proven superior to no treatment (Fairburn, Agras, & Wilson, 1992), to antidepressant treatment (Agras et al., 1992), and to other forms of psychotherapy, including supportive-expressive therapy (Garner et al., 1993), psychodynamic therapy (Walsh et al., 1997), and short-term focal psychotherapy (Fairburn, Kirk, O'Connor, & Cooper, 1986). Only interpersonal psychotherapy (IPT) has demonstrated similar outcomes to CBT, although the course of recovery with IPT is more protracted (Agras, Crow, et al., 2000).

### **Efficacy of Brief Group Psychoeducation or other Brief or Non-Therapist-Led Approaches**

Face-to-face individual psychotherapy is logistically complicated, requires considerable therapist training, and is often difficult to find outside of regions that contain specialized treatment settings. For BN, the efficacy of various forms of psychoeducational approaches that do not require the same intensity of intervention, measured by abstinence rates from binge eating and purging, varies in the literature between 20% and 35% (Davis, Olmsted, & Rockert, 1990; Fernández-Aranda et al., 1998, 2004). Although these abstinence rates are not as consistently high as those observed in individual face-to-face therapy trials (Fairburn, Jones, Peveler, Hope, & O'Connor, 1993; Fairburn, Marcus, & Wilson, 1993), given the potential broader public health reach of these interventions, these numbers are promising. In general, these interventions are particularly suited to patients who demonstrate less severity and psychopathology (Davis, Olmsted, Rockert, Marques, & Dolhanty, 1997; Fernández-Aranda et al., 2004). To date, no studies have explored the applicability of these approaches across a spectrum of severity in individuals with BN.

In terms of treatment response of individuals with sub-BN, virtually nothing is known because there have been no studies of the treatment of these patients. Exceptions are two studies conducted by Nevenon et al. (Nevenon & Broberg, 2006; Nevenon, Broberg, Lindstroem, & Levin, 1999) that tested a CBT group psychotherapy model immediately followed by IPT for both full-BN and sub-BN patients. Findings revealed significant pre-to posttreatment differences for eating disorder symptoms and attitudes as well as interpersonal problems and general psychopathology for both BN groups, which could even be observed at 1- and 2.5-year follow-ups.

This omission of treatment response of sub-BN patients is critical for several reasons. First, research has documented the clinical significance of subthreshold eating-related problems that have evolved from previous eating disorders (Lewinsohn, Striegel-Moore, & Seeley, 2000). Second, there is evidence that the severity of psychopathology and degree of secondary psychosocial impairment in those with sub-BN are comparable to those seen in patients with anorexia nervosa (AN) or BN (Ricca et al., 2001; Turner & Bryant-Waugh, 2004).

In summary, even though there is a body of evidence on the efficacy of CBT for threshold BN, strikingly little is known about the treatment and course of sub-BN diagnoses.

## Aims of the Study

In the context of a brief outpatient psychoeducational intervention for BN and sub-BN, the goals of the current study are twofold: (a) to report symptomatological and personality differences between threshold and sub-BN cases and (b) to compare the short-term response to a brief outpatient psychoeducational intervention in individuals with full and sub-BN. We hypothesized that, even though full-BN and sub-BN patients would diverge on baseline eating disorder symptomatology, they would both profit from a brief psychoeducational intervention.

## Method

### Participants

Entry into the study was between January 2004 and January 2005. The total sample included 78 female patients who were admitted for treatment at the Eating Disorders Unit of the Department of Psychiatry at the University Hospital of Bellvitge. Thirty-nine women fulfilled the *Diagnostic and Statistical Manual of Mental Disorders* (fourth edition, text revision [*DSM-IV-TR*]; APA, 2000a) criteria for threshold BN (full-BN group), and 39 were diagnosed with sub-BN. The latter diagnosis was given if the individual met all criteria for BN but reported no objective binge episodes and no purging behavior or could not meet the frequency criteria. Given that the patients at our unit normally undergo three to four initial interviews before starting treatment, we were able to ensure that the subthreshold symptoms had been present for a minimum of 4 weeks before starting treatment. Of note, 69% of individuals with sub-BN reported having met criteria for full BN in the past. Interestingly, of these patients, 11.8% had presented a complete remission from BN, defined as being asymptomatic for at least 3 months before relapsing into the partial BN diagnosis. In the sub-BN group, 45.5% did not report an objective binge-eating episode and 21.6% did not exhibit any purging behaviors.

A pairwise matching comparison procedure was used to compose the control sample (full-BN patients); the SPSS 13 program was used so that the symptomatological and personality differences between full and sub-BN cases could be compared in a more systematic form. Each participant in the sub-BN group ( $n = 39$ ) was paired with a randomly selected threshold BN patient of the same age, age at onset, and duration of the disorder from a larger pool of 175 full-BN individuals using propensity scores. If these procedures had not been carried out, it could have been argued that differences in

treatment outcome were influenced by these variables and, therefore, did not reflect the real treatment effectiveness. Most patients were single (80.8%) and had at least some university education (71.4%). Forty-six percent of the patients were employed, and 48.7% attended consultation voluntarily. The mean age for the total sample was 23.8 years ( $SD = 4.8$ ). There were no statistically significant differences between the two groups in age or education ( $ps = .833$  and  $.245$ , respectively).

The inclusion criteria for the study were (a) female sex, (b) age greater than 18 years, (c) meeting *DSM-IV-TR* criteria (APA, 2000a) for BN or sub-BN, and (d) body mass index (BMI) greater than 18. Conversely, patients were excluded if they met any of the following criteria: (a) male sex, (b) missing values for any diagnostic items, (c) high severity of eating disorder or psychopathology, (d) current alcohol or drug abuse, or (e) current psychotic disorder. For the present analysis, the following individuals had to be excluded: (a) males ( $n = 7$ ), because the number of males with these diagnoses was too small for meaningful comparisons, and (b) participants with greater severity of eating disorder or other psychiatric symptoms indicating inpatient intervention ( $n = 36$ ) or individual therapeutic or medical intervention ( $n = 24$ ). All of the patients who had been excluded from the study were treated separately with different therapeutical modalities. Disposition decisions were made by psychologists or psychiatrists who completed the anamnesis together with the treatment team according to published treatment guidelines (APA, 2000b) for CBT treatment. The Ethics Committee of our institution approved this study, and informed consent was obtained from all participants.

### Measures

*Eating Attitudes Test (EAT-40; Garner & Garfinkel, 1979)*. This questionnaire contains 40 items, including symptoms and behaviors common to eating-disordered patients, and provides an index of the severity of the disorder. Scores range from 0 to 120. The higher the score, the more disturbed the eating behavior. The cutoff score is generally set at 30 and differentiates between pathological and nonpathological populations. This questionnaire was adapted to the Spanish population, showing high internal consistency (Cronbach's  $\alpha = .93$ ; Castro, Toro, Salamero, & Guimerá, 1991).

*Eating Disorders Inventory-2 (EDI-2; Garner, 1998a)*. This reliable and valid 91-item multidimensional self-report questionnaire assesses different cognitive and behavioral characteristics that are

typical for eating disorders. The EDI-2 retains the 64 items (grouped into eight scales: Drive for Thinness, Bulimia, Body Dissatisfaction, Ineffectiveness, Perfectionism, Interpersonal Distrust, Interoceptive Awareness, Maturity Fears) of the EDI and adds 27 new items into three provisional scales: Asceticism, Impulse Regulation, and Social Insecurity. All of these scales are answered on a 6-point Likert scale and provide standardized subscale scores. This instrument was validated in a Spanish population (Garner, 1998b), with a mean internal consistency of .63 (coefficient alpha).

*Symptom Checklist-90-Revised (SCL-90-R; Derogatis, 1990).* To evaluate a broad range of psychological problems and symptoms of psychopathology, the SCL-90-R was used. This test contains 90 items and helps to measure nine primary symptom dimensions: Somatization, Obsession–Compulsion, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism. In addition, it includes three global indices: a global severity index (GSI), designed to measure overall psychological distress; a positive symptom distress index (PSDI), designed to measure the intensity of symptoms; and a positive symptom total (PST), which are reports of 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 .75 (coefficient alpha).

*Bulimic Investigatory Test, Edinburgh (BITE; Henderson & Freeman, 1987).* This questionnaire contains 33 items that measure the presence and severity of the bulimic symptoms. There are two subscales: the Symptomatology scale (30 items), which determines the seriousness of the symptoms, and the Severity scale (three items), which offers a severity index. The cutoff point for the Symptomatology scale scores for the present study were as follows:  $\leq 10$  = no symptomatology,  $10-20$  = sub-clinical symptoms, and  $\geq 20$  clinical symptoms. The higher the score, the greater the severity. This questionnaire has been found to have an adequate internal consistency for both subscales (for Symptomatology and Severity subscales, Cronbach's  $\alpha = .82$  and  $.63$ , respectively) and has been adapted to the Spanish population (Rivas, Bernabé, & Jiménez, 2004).

*Temperament and Character Inventory-Revised (TCI-R; Cloninger, 1989).* This reliable and valid 240-item, 5-point Likert-type questionnaire measures, as in the original TCI version (Cloninger, Svrakic, & Przybeck, 1993), seven dimensions of

personality: four temperament dimensions (Harm Avoidance, Novelty Seeking, Reward Dependence, and Persistence) and three character dimensions (Self-Directedness, Cooperativeness, and Self-Transcendence). The performance on the Spanish version of the original questionnaire (Gutierrez et al., 2001) and the revised version (Gutierrez-Zotes et al., 2004) have been documented. The revised version has exhibited high internal consistency (for the different subscales,  $\alpha = .77-.87$ ; Gutierrez-Zotes et al., 2004).

*Social Avoidance Distress Scale (SAD; Watson & Friend, 1969).* This 28-item scale was designed to measure the degree of distress, discomfort, anxiety, and avoidance of social situations. Higher scores indicate greater social avoidance and distress. A Spanish version of the present scale was applied in a clinical population (Bobes et al., 1999) and showed a cutoff point of 19. This scale was also adapted to the Spanish population and yielded a high internal consistency (Cronbach's alpha coefficient = .90).

*Evaluation of sociodemographic and clinical variables.* Additional demographic information, including age, marital status, education, occupation, living arrangements, motivation to receive treatment, and parental occupation, and clinical relevant variables regarding their eating disorder and psychopathological symptoms and family history of eating disorders were assessed by a structured clinical interview (Fernández-Aranda & Turon, 1998).

## Procedure

Experienced psychologists and psychiatrists with master's or doctoral degrees conducted a 2-hr structured diagnostic face-to-face interview with participants to measure eating disorder symptoms and psychopathological traits. Eating disorder diagnoses were based on this interview and were consensually derived among members of the clinical team who had participated in the assessment. In addition to a comprehensive clinical and psychological evaluation (including the instruments mentioned previously), further demographic information was obtained. Finally, participants completed the questionnaires individually in a room before starting the treatment. An information sheet presented at the start of the questionnaire informed the participants about the purpose of the study and ensured confidentiality of results. Furthermore, it was emphasized that participation in the study was completely voluntary and that participants were free to withdraw from the study at any time. The therapeutic approach was explained during the first

session, and therapeutic material was provided. The assessment was repeated at the end of the treatment. Remission was defined as abstinence from bingeing and purging for a minimum of 2 weeks. Previous research has generally indicated remission at 8 (Herzog et al., 1999) and 4 (Agras, Walsh, et al., 2000) weeks. Only some have referred to a 2-week period (Pyle et al., 1990). For the present study, a 2-week remission period was chosen because of the relatively short duration and intensity (6 weeks) of the psychoeducational group therapy.

### Treatment

The psychoeducational brief group therapy was based on the Davis et al. (1990) model. In our study, this intervention consisted of six weekly outpatient sessions (90 min each) with a total of eight to 10 patients per group. Both full-BN and sub-BN patients were treated together in this same brief outpatient psychoeducational therapy. The range of the number of previous treatments was between zero and three. The psychoeducational group was directed by a psychologist and a cotherapist. The main objective of this brief group intervention was to offer information and psychoeducation about BN without going into details of the patients' individual problems. The topics addressed included general information and negative consequences of BN, nutritional patterns and monitoring of meal plans, preventing strategies for decreasing bingeing and purging behavior, cognitive model for the comprehension of BN, problem-solving strategies, and relapse prevention. This program and accompanying program material have already been manualized and published in Spanish (Fernández-Aranda & Turon, 1998).

### Statistical Analysis

Analyses were conducted using SPSS-13. First, the differences between full- and sub-BN patients in baseline clinical and psychological features were evaluated. For quantitative responses, means were compared with Student's *t* tests for independent samples. For categorical responses, proportions were compared with standard Pearson's chi-square test (exact Monte Carlo procedures were used for small samples). Association measures in contingency tables (proportion ratios) were obtained with SPSS macros (Doménech, Bonillo, & Granero, 2000).

Second, because we assessed a variety of outcome variables in this study, we structured our analyses according to primary (reduction of and abstinence from bingeing and purging behaviors) and secondary (psychological, personality, comorbid psycho-

pathology, and treatment adherence) outcome variables. Given that multiple variables are required to capture symptomatic outcome from BN (reduction of and abstinence from binge eating and purging), we considered them as a family of primary outcome variables. The statistical analyses consisted of evaluating the observed changes (after the intervention) in these clinical outcome variables. This change was measured as the difference between pre- and posttreatment responses. Next, the mean differences obtained for the full-BN and sub-BN patients were compared. Another primary outcome variable that we compared between both diagnosis subtypes was the psychological state of patients after therapy (valued as the absence of bingeing and vomiting episodes).

Finally, treatment adherence (number of sessions attended and dropout rates), a secondary outcome variable, was also compared between full-BN and sub-BN individuals at the end of the intervention. The mean changes achieved in quantitative clinical outcome measures were statistically compared between diagnosis subtypes with analyses of variance procedures adjusted by the frequency of binge eating and purging at the beginning of treatment (analysis of covariance). Binary clinical outcome measures were compared between full-BN and sub-BN patients with logistic regression models, also adjusted by frequency of binge eating and purging before the treatment.

## Results

### Comparison of Baseline Clinical and Personality Features

There were no significant differences between the groups on means for age (full BN = 23.9 vs. sub-BN = 23.7;  $p = .83$ ), age of onset (full BN = 18.3 vs. sub-BN = 17.4;  $p = .37$ ), duration of disorder (full BN = 5.8 vs. sub-BN = 6.3;  $p = .65$ ), number of previous treatments (full BN = 0.4 vs. sub-BN = 0.7;  $p = .07$ ), or BMI (full BN = 22.9 vs. sub-BN = 21.9;  $p = .10$ ). However, as expected, there were significant differences on the weekly frequency of binge eating (full BN = 6.9 vs. sub-BN = 1.2;  $p < .0005$ ) and vomiting (full BN = 7.5 vs. sub-BN = 2.9;  $p = .003$ ) episodes. Given these considerable baseline differences, the frequency of binge eating and purging at baseline was entered as an adjustment variable into the statistical models evaluating treatment outcome.

As shown in Table I, at baseline there were no significant differences on TCI-R temperament or character dimensions between the two groups. There were no differences in total mean scores for

Table I. Clinical and Psychological Features at the Beginning.

Quantitative measure	BN ( <i>n</i> = 39)		Sub-BN ( <i>n</i> = 39)		Means comparison			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	95%CI	<i>MD</i>
TCI-R Novelty Seeking	108.1	15.7	107.9	14.9	.075	0.940	−6.80	7.33
TCI-R Harm Avoidance	116.7	24.9	113.9	19.4	.546	0.587	−7.44	13.06
TCI-R Reward Dependence	104.0	16.0	105.3	15.8	.358	0.721	−8.63	6.00
TCI-R Persistence	106.2	16.7	112.6	17.3	1.63	0.108	−14.2	1.44
TCI-R Self-Directedness	115.3	23.3	117.8	22.6	.475	0.636	−13.2	8.11
TCI-R Cooperativeness	136.7	17.7	133.5	13.6	.891	0.376	−4.04	10.55
TCI-R Self-Transcendence	68.3	15.2	69.7	15.0	.391	0.697	−8.30	5.58

Categorical measure	Percentage –%		Percentages comparison			
	(95%CI)	(95%CI)	$\chi^2$	<i>p</i>	95%CI	PR
Alcohol abuse	10.3 (2.87; 24.2)	8.3 (1.75; 22.5)	0.082	.999	0.30	5.13
Other drugs abuse	17.9 (7.54; 33.5)	11.1 (3.11; 26.1)	0.699	.403	0.52	5.06
Self-harm behavior	30.8 (17.0; 47.6)	31.4 (16.9; 49.3)	0.004	.951	0.50	1.93
Suicidal ideation	43.6 (27.8; 60.4)	41.7 (25.5; 59.2)	0.028	.866	0.62	1.77
Suicidal attempts	30.8 (17.0; 47.6)	22.2 (10.1; 39.2)	0.699	.403	0.64	2.99
Hyperactivity (medium-high)	60.5 (43.4; 76.0)	47.1 (29.8; 64.9)	1.310	.252	0.83	2.00
Obesity in childhood	7.7 (1.61; 20.9)	8.6 (1.80; 23.1)	0.019	.999	0.19	4.16
Family history						
Anorexia	23.7 (11.4; 40.2)	8.6 (1.80; 23.1)	3.003	.082	0.81	9.39
Bulimia	15.4 (5.86; 30.5)	20.0 (8.44; 36.9)	0.271	.602	0.29	2.07
Obesity	17.9 (7.53; 33.5)	22.9 (10.4; 40.1)	0.275	.600	0.32	1.94
Alcohol abuse	23.1 (11.1; 39.3)	28.6 (14.6; 46.3)	0.292	.589	0.37	1.76
Affective disorder	61.5 (44.6; 76.6)	60.0 (42.1; 76.1)	0.018	.892	0.71	1.48

Note. BN = bulimia nervosa; C = confidence interval; MD = mean difference; TCI-R = Temperament and Character Inventory-Revised; PR = proportion ratio.

SCL-90-R GSI (full BN = 1.81 vs. sub-BN = 1.49;  $p = .078$ ), SCL-90-R PSDI (full BN = 2.33 vs. sub-BN = 2.12;  $p = .131$ ), SCL-90-R PST (full BN = 66.5 vs. sub-BN = 60.9;  $p = .195$ ), EDI-2 total (full BN = 113.4 vs. sub-BN = 96.5;  $p = .098$ ), EAT (full BN = 53.5 vs. sub-BN = 47.2;  $p = .228$ ), and SAD (full BN = 13.6 vs. sub-BN = 13.5;  $p = .943$ ). However, full-BN women scored higher on the BITE Symptomatology (full BN = 24.8 vs. sub-BN = 21.3;  $p = .002$ ) and Severity (full BN = 15.9 vs. sub-BN = 10.8;  $p = .003$ ) scales (Table II). These patients also obtained higher scores on the Bulimia subscale of the EDI-2 (full BN = 10.3 vs. sub-BN = 5.62;  $p = .001$ ) and the Depression (full BN = 2.23 vs. sub-BN = 1.80;  $p = .029$ ) and Phobic Anxiety (full BN = 1.36 vs. sub-BN = 0.87;  $p = .045$ ) subscales of the SCL-90-R.

Finally, the categorical clinical features measured before treatment revealed no significant differences between full- and sub-BN patients on alcohol abuse, drug abuse, self-harm behavior, suicidal ideation, suicidal attempt, hyperactivity levels, obesity during childhood, and family antecedents in any of the following variables: anorexia, bulimia, obesity, alcohol abuse, and affective disorders.

### Comparison of Therapy Outcome for Full-Versus Sub-BN

*Primary outcome variables: reduction of and abstinence from bingeing and purging behaviors.* After controlling for baseline values, individuals with full BN reported a greater change in the frequency of weekly binge eating and vomiting episodes. Women with full BN reported a mean weekly reduction of 6.4 binges, whereas sub-BN patients reported a mean weekly reduction of 0.9 bingeing episodes ( $p < .0005$ ). The mean reduction of vomiting episodes reported was 5.9 in patients with full BN and 2.06 in patients with sub-BN ( $p = .001$ ). At the end of treatment, abstinence rates did not differ between the two groups (abstinence from binge eating and vomiting: full BN = 33.3% vs. sub-BN = 35.2%;  $p = .461$ ; abstinence from binge eating: full BN = 33.3% vs. sub-BN = 39.8%;  $p = .207$ ; and abstinence from vomiting: full BN = 57.3% vs. sub-BN = 62.5%;  $p = .752$ ). Weekly frequency of laxative use also showed a greater decrease in full-BN patients ( $p = .001$ ) compared with sub-BN patients. (See Table II for a between-group comparison of changes, measured as the pre-post change scores.)

Table II. Study of the Changes Between Pre- and Posttreatment.

Variable	Clinical state ( <i>M</i> )				Adjusted mean changes <sup>a</sup>					
	Initial		Final		Mean changes		ANCOVA results			
	BN ( <i>n</i> = 39)	Sub-BN ( <i>n</i> = 39)	BN ( <i>n</i> = 34)	Sub-BN ( <i>n</i> = 29)	BN	Sub-BN	MD	<i>p</i>	95%CI	MD
Weekly frequency										
Binges	6.90 (5.6)	1.20 (3.5)	1.10 (1.20)	2.00 (3.70)	-6.40	-0.90	-5.540	<.0005	-7.540	-3.540
Vomits	7.50 (6.9)	2.90 (6.0)	1.00 (1.70)	2.40 (4.09)	-5.90	-2.06	-3.880	.0010	-5.920	-1.850
Laxatives	6.40 (16.0)	1.40 (4.0)	2.50 (8.00)	0.48 (1.70)	-6.50	-2.32	-4.200	.0010	-6.490	-1.910
Diuretics	1.00 (2.9)	1.00 (3.4)	0.77 (2.80)	0.11 (0.58)	-0.51	-0.91	0.395	.7470	-2.120	2.920
BMI	22.90 (2.6)	21.90 (2.4)	23.20 (2.40)	22.00 (2.40)	0.04	0.14	-0.098	.5520	-0.438	0.242
EAT total	53.50 (19.9)	47.20 (24.4)	35.20 (23.30)	35.00 (25.60)	-19.8	-12.10	-7.690	.2720	-21.900	6.530
EDI-2 total	113.00 (47.2)	96.50 (40.4)	84.70 (48.80)	73.10 (40.20)	-29.4	-25.80	-3.590	.8210	-37.000	29.800
BITE										
Symptom.	24.80 (4.1)	21.30 (5.7)	20.60 (7.90)	16.30 (7.40)	-4.54	-2.80	-1.710	.5520	-7.630	4.200
Severity	15.90 (7.0)	10.80 (7.5)	9.60 (7.10)	6.00 (5.40)	-6.83	-3.20	-3.630	.1210	-8.310	1.050
SAD total	13.60 (9.4)	13.50 (7.3)	10.80 (9.70)	12.20 (8.90)	-0.48	-2.80	2.330	.3840	-3.430	8.090
SCL-90-R										
GSI	1.81 (0.8)	1.49 (0.7)	1.40 (0.90)	1.20 (0.80)	-0.28	-0.36	0.074	.7680	-0.442	0.590
PSDI	2.33 (0.6)	2.12 (0.6)	2.00 (0.66)	1.90 (0.72)	-0.23	-0.27	0.044	.8560	-0.460	0.549
PST	66.50 (18.8)	60.90 (18.7)	54.70 (25.70)	50.00 (24.80)	-7.67	-10.00	2.330	.7650	-13.700	18.400

Note. ANCOVA = analysis of covariance; BN = bulimia nervosa; MD = mean difference; CI = confidence interval; BMI = body mass index (ratio: kg/m<sup>2</sup>); EAT = Eating Attitudes Test; EDI-II = Eating Disorders Inventory; BITE = Bulimic Investigatory Test, Edinburgh; SAD = Social Avoidance Distress Scale; SCL-90-R = Symptom Checklist-90-Revised; GSI = global severity index; PSDI = positive symptom distress index; PST = positive symptom total.

<sup>a</sup>Results adjusted by frequency of binge eating and purging at baseline. Change = difference between pre-post values.

*Secondary outcome variables: psychological, personality, comorbid psychopathology, and treatment adherence.* There were no other significant differences in mean changes on other total scores in clinical, psychopathological and personality features across diagnoses. Regarding the subscales of the EDI-2 and the SCL-90-R, the only statistically significant difference was found for the EDI-2 Impulse Regulation subscale (mean reduction was 4.3 for full BN and 0.43 for sub-BN;  $p = .045$ ). Comparisons between groups for treatment adherence showed that 19.4% (full-BN group = 13.5% and sub-BN group = 25.7%) of the patients had dropped out from treatment. Even though almost twice as many sub-BN patients dropped out from treatment compared with full-BN patients, this difference was not statistically significant (odds ratio = 0.94;  $p = .960$ ). Because no follow-up of these patients had been conducted, reasons for dropout could not be assessed. Finally, no significant differences between the groups on number of sessions attended (adjusted mean: full BN = 5.4 vs. sub-BN = 4.6;  $p = .084$ ) could be detected. There were no harms or adverse events associated with treatment. No patient had to be withdrawn from the psychoeducational intervention or given inpatient or medication treatment.

### Discussion

The current study is a novel contribution to the literature by comparing outcome of a brief psychoeducational program on full- and sub-BN patients and addresses several fundamental issues.

The first main finding was that, although generally full BN and sub-BN are currently considered separate diagnostic categories (APA, 2000a, 2000b), with the exception of symptom severity (frequency of binge eating and vomiting) and the depression and anxiety scores, no significant differences were observed at baseline between the groups on other eating disorder symptoms or psychopathological or personality traits. This suggests that the sub-BN form of EDNOS may represent a continuum of severity rather than a discrete diagnostic entity. The fact that 69% of individuals with sub-BN had met full criteria in the past suggests the importance of considering a stage of illness classification that accounts for changes in symptom severity over time rather than necessitating a switch to a different diagnostic classification (Crow, Agras, Halmi, Mitchell, & Kraemer, 2002).

Second, in terms of therapy outcome, we observed that, after a brief psychoeducational intervention, there were significant differences in symptom change for our primary outcome variables. A significant

reduction in binge eating and vomiting frequency was observed for both groups after treatment. Specifically, the full-BN patients reduced the number of weekly bingeing episodes by, on average, 6.4, whereas the sub-BN patients only achieved a mean reduction of 0.9 episodes. This reflects in part the greater initial symptomatology in full-BN patients and the fact that they had more room for improvement. Conversely, when the abstinence rates by the end of therapy were assessed for both groups, no significant differences between full- and sub-BN groups were detected either on binges (33.3% and 39.8%, respectively) or on vomiting episodes (57.3% and 62.5%, respectively). Conversely, frequency of laxative use revealed significant differences between the two groups after treatment. These results indicate that both groups profit from the same psychoeducational intervention. In relation to full BN, research has shown that psychoeducation is a useful first intervention for individuals with mild to moderate full BN, as previously reported by others (Daley & Hartman, 1999; Davis et al., 1990; Fernández-Aranda et al., 1998, 2004; Olmsted, Kaplan, Rockert, & Jacobsen, 1996). Conversely, for sub-BN, this is, to our knowledge, the first study that has tested such a psychoeducational treatment program. As noted by others (Fairburn & Harrison, 2003; Grilo et al., 2003), our findings argue that the clinical management of sub-BN need not differ from that of full BN.

In relation to our secondary therapy outcome variables, no significant differences in symptom change were found for most of the psychopathological and personality features. The only exception was found on the Impulse Regulation subscale of the EDI-2, in which a significant reduction for both groups was observed after treatment. The full-BN group exhibited more change for these variables than the sub-BN group. The brief psychoeducational group therapy we applied in our study yielded a dropout rate of 19.4% (full-BN group = 13.5%, sub-BN group = 25.7%). These results are somewhat lower than those reported in other studies (17.2–27.3%; McKisack & Waller, 1997). As we have indicated in previous work (Fernández-Aranda et al., 1998), two factors account for this discrepancy. First, the psychoeducational intervention is brief and perhaps less prone to dropout. Second, we provide motivational work with our patients before initiating therapy, which could improve adherence. Despite the absence of statistical significance, it should be acknowledged that almost twice as many patients from the sub-BN group (13.5% vs. 25.7%) dropped out. Research has shown that adherence to treatment is related to motivation to change in eating disorders (Ametller, Castro, Serrano, Martinez, &

Toro, 2005). Accordingly, previous studies have indicated a lower motivation to change in EDNOS patients compared with BN and AN individuals (Casasnovas et al., 2007). This differential resistance to treatment observed between eating disorder subtypes may be related to low self-efficacy and passive attitude to their own capacity to change (Blake, Turnbull, & Treasure, 1997) and differences in decisional balances (pro-cons) vis-à-vis their current situation (Cockell, Geller, & Linden, 2002).

The results of the present study have various clinical implications. First, brief psychoeducational interventions appear to confer benefit for both individuals with full BN as well as sub-BN. Second, with the exception of severity of eating disorder symptoms, few differences emerged between those with full BN or sub-BN on clinical, personality, or outcome variables.

This study does have some limitations. First, the sample size was relatively small. Although few significant differences were observed between the two groups, this does not mean that differences would not emerge with large samples or with different definitions of sub-BN. Second, we reported a 2-week abstinence period rather than a 4- or 8-week period because of the brief nature of the intervention: A longer period of abstinence is needed to ensure stability of change. Third, although the literature has shown little effect of no treatment in BN (Fernández-Aranda et al., 1998), in sub-BN data are lacking as to the impact of a no-treatment or placebo control. Fourth, we report no medium- to long-term follow-up data. Because we only assessed the participants at the termination of the short intervention, there is no way of knowing whether these effects persist over time.

Future studies should aim to overcome these limitations and should also include follow-up durations of at least 6 months to 1 year. Finally, replicating the present study in a group therapy of longer duration could clarify predictors of various forms of treatment within the EDNOS category.

To summarize, this study has shown that, first, full-BN and sub-BN share common psychopathological symptoms and personality traits. Second, no differences in therapy outcome, after a brief group approach, were observed for the two groups in terms of general eating disorder symptomatology and psychopathology. On the basis of results from the present study, it can be concluded that both individuals with threshold and sub-BN profit from brief psychoeducational interventions.

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