Eating disorder and obsessive–compulsive symptoms in a sample of bulimic women: Perfectionism as a mediating factor

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Article info
Article history:
Received 27 April 2012
Received in revised form 18 August 2012
Accepted 29 August 2012
Available online 25 September 2012

Keywords:
Bulimia nervosa
Obsessive–compulsive symptoms
Perfectionism

Abstract
The present study aimed to investigate whether perfectionism mediates the association between obsessive–compulsive (OC) and eating disorder (ED) symptoms. Analyses were conducted using data collected among a national sample of eating disordered women diagnosed with BN or a subclinical variant of BN (N = 204). Each participant completed a series of self-report inventories on perfectionism, as well as OC, ED, and depressive symptoms. Higher ED symptoms were significantly associated with greater levels of perfectionism (p < .01) and OC symptoms (p < .05). As hypothesized, perfectionism significantly mediated the relationship between ED and OC symptoms, controlling for depression. Findings indicate that perfectionism may be considered a shared etiological or phenomenological factor in ED and OC symptoms.

1. Introduction

High rates of comorbidity exist between eating disorders (ED), such as anorexia nervosa (AN) and bulimia nervosa (BN), and obsessive–compulsive disorder (OCD) (Jordan et al., 2003; Milos, Spindler, Ruggiero, Klaghofer, & Schnyder, 2002; Pigott et al., 1991; Speranza et al., 2001). Among those with OCD, a lifetime or concurrent ED diagnosis is commonly observed (Bogetto, Venturello, Albert, Maina, & Ravizza, 1999; Lochner et al., 2004), and multiple studies reveal elevated obsessive–compulsive symptoms among adolescents and adults suffering from an ED (Cassidy, Allsopp, & Williams, 1999; Halmi et al., 2000). Halmi et al. (2000) reported that up to 79.1% of AN patients endorsed lifetime obsessions and compulsions (OC), and the Price Foundation Collaborative Genetics Study (Kaye et al., 2004) identified OCD as the most common anxiety disorder diagnosed among those with AN and BN. Additionally, up to 40% of those with BN and 10–60% of those with AN appear to suffer from OCD, independent of food-related obsessions and compulsions (Godart, Flament, Perdereau, Jeammet, & Strober, 2002).

Some investigators have proposed that the association between OCD and ED can be accounted for by shared phenomenological features. In AN and BN, for example, pervasive food- and weight-related thoughts have been described as obsessional, and such cognitions are often associated with ritualized eating behaviors (Pigott et al., 1991). Moreover, the act of purging appears to possess anxiety-reducing properties akin to the neutralizing aspects of compulsions in OCD (Formea & Burns, 1995; Kaye, Gwirtsman, George, & Weiss, 1986). Some have thus theorized that eating disorders may exist along an obsessive–compulsive spectrum (Bienvenu et al., 2000; Hollander & Wong, 1995; McElroy, Phillips, & Keck, 1994). In this way, ED may be considered a variant of OCD in phenotype (Bellodi et al., 2001; Speranza et al., 2001). A family study indicates that AN and BN are significantly more prevalent among those with OCD and their first-degree relatives compared to both unaffected control probands and relatives of controls (Bienvenu et al., 2000). Bellodi et al. (2001) furthermore demonstrated that the prevalence of OCD was significantly higher among relatives of ED probands (AN and BN) compared to relatives of controls (9.69% versus 0%).
Some researchers have hypothesized that ED and OCD share a common biological basis or etiology (Cavallini, Bertelli, Chiapparino, Riboldi, & Bellodi, 2000; Speranza et al., 2001), including different genetic or temperamental factors. Miguel et al. (2005) noted that shared personality features may guide etiological and genetic investigations of ED and OCD. One such personality factor is perfectionism, which appears to be related to both OC symptoms (Frost & Steketee, 1997; OCCWG, 2003; Tozzi et al., 2004) and ED (Bulik et al., 2003; Halmi et al., 2000). Perfectionism appears to exist prior to the onset of an ED diagnosis (Fairburn, Cooper, Doll, & Welch, 1999; Tarka, Waldon, Graber, Brooks-Gunn, & Strober, 2002), remains significantly elevated during acute illness compared to controls (Bastiani, Rao, Weltzin, & Kaye, 1995; Lilenfeld et al., 2000), and persists at elevated levels up to 3 years after recovery (Kaye et al., 1998; Stein et al., 2002). In nonclinical samples, perfectionism also appears predictive of problematic eating as a main effect (Pearson & Gleaves, 2006) or in interaction with other risk factors (Joiner, Heatherton, Rudd, & Schmidt, 1997b; Vohs et al., 2001). At least one investigation among nonclinical samples of OCD further demonstrates a positive association between perfectionism and OC tendencies (Rheaume, Ladouceur, & Freeston, 2000).

These and other studies suggest that perfectionism may be a relatively stable feature, particularly among individuals with ED (Joiner, Heatherton, & Keel, 1997a). Perfectionism is considered a multidimensional personality trait (Frost, Maren, Lahart, & Rosenblate, 1990; Hewitt & Flett, 1991; Pearson & Gleaves, 2006); and although it may be considered both adaptive and maladaptive, the general construct appears to predict overall maladjustment, increased depressive symptoms, and stress (Dunkley, Zuroff, & Blankstein, 2006). Among literature reviews, both adaptive and maladaptive dimensions of perfectionism appear to be elevated in ED, whereas only maladaptive dimensions tend to be elevated in depression and anxiety (Bardone-Cone et al., 2007). As a cognitive style or personality trait, perfectionism may also confer risk for the pathogenesis of ED (AN and BN) and OCD (Cassidy et al., 1999; Obsessive–Compulsive Cognitions Working Group, 2003).

Halmi et al. (2005) investigated whether the prevalence of OCD, obsessive–compulsive personality disorder (OCPD), and perfectionism varied among specific ED subtypes. Among 607 participants, results indicated that perfectionism scores and the rate of comorbid OCD diagnoses did not significantly vary among specific ED subtypes; perfectionism instead appeared highest among ED participants with comorbid OCD and OCPD. These constructs were examined at the diagnostic level only, and the relationship between variables at the symptom level was not specifically examined. Perfectionism was also not evaluated as a potential explanatory factor in the association between ED and OC symptoms.

To our knowledge, no study has examined how perfectionism may mediate the relationship between elevated ED and OC symptoms. Given the high rates of comorbidity between ED and OCD, and their respective associations with perfectionism, we attempted to simultaneously examine the relationship between perfectionism, ED symptoms, and OC symptoms within a single sample. We furthermore examined whether perfectionism statistically mediated the ED–OC association. In a cross-national convenience sample of women with clinically-significant bulimic symptoms, we hypothesized that elevated ED symptoms would independently predict both elevated OC symptoms and greater perfectionism. Next, we hypothesized that greater perfectionism would be associated with elevated OC symptoms, controlling for ED symptoms, and that perfectionism would mediate the link between elevated ED and OC symptoms. Finally, given the high rate of co-occurrence between depression, eating disorders, and OCD, we examined whether the proposed effects existed independent of depression.

2. Materials and methods

2.1. Participants

Two hundred and four females, aged 18–57 years (M = 25.67, SD = 8.85) were recruited through advertisements in ED clinics and surrounding communities at five national sites (Madison, WI; Minneapolis, MN; Fargo, ND; Chicago, IL; and Columbia, MO) for a study of BN.1 Inclusion criteria included female sex; age 18–65; and the presence of substantial binge eating and compensatory behaviors. Exclusion criteria included current psychotic disturbances, organic brain syndromes, and illiteracy. Of the 204 women participating in the study, 139 met DSM-IV diagnostic criteria for BN, purging type; four met diagnostic criteria for BN non-purging type; 32 were categorized as subclinical BN (i.e., they showed substantial bulimic symptoms, but did not meet the diagnostic threshold for BN; binge eating and compensatory behaviors were present, but occurred less than twice/week); and 29 participants were categorized as subjective BN (i.e., they displayed purging behavior, but binges did not meet objective binge eating criteria). These diagnostic variations are considered acceptable in light of evidence suggesting that a “threshold” versus “sub-threshold” BN distinction may be unclear. Studies have identified negligible differences on psychopathological indices between individuals who binge or purge at subthreshold versus threshold levels (Crow, Agras, Halmi, Mitchell, & Kraemer, 2002; Fairburn & Harrison, 2003; Le Grange et al., 2006; Lewinsohn, Striegel-Moore, & Seeley, 2000), or whose caloric intake suggests “subjective” versus “objective” binges (Pratt, 1998). The ethnic composition of the sample was: 90.7% Caucasian, 2.5% African American, 1.5% Hispanic, 3.4% Asian, and 2.0% other/unknown.

2.2. Procedures

Research personnel completed a brief diagnostic phone screen with participants who expressed interest in the study. The phone screen included questions from the Structured Clinical Interview for DSM-IV (SCID) (First, Spitzer, Gibbon, & Williams, 1995) for both BN and AN Eating Disorder modules. Subjects who met current DSM-IV diagnostic criteria for BN or who displayed clinically significant bulimic symptomatology were invited to participate. If a subject was eligible for the study, informed consent was obtained. After entry into the study, an appointment was made in which participants were asked to complete a series of questionnaires, described below. At the completion of assessments, subjects were compensated for their time.

2.3. Measures

2.3.1. Maudsley Obsessive–Compulsive Inventory (Hodgson & Rachman, 1977)

The MOCI is a 30-item, self-report measure of OC symptoms. Overt rituals and obsessions are assessed in a true–false format, yielding one total obsessionality score, along with four subscale scores (Checking, Washing, Doubting, Slowness–Repetition). The scale has demonstrated satisfactory reliability and internal consistency (Rachman & Hodgson, 1981). The MOCI total score was used for primary analyses in the present study.

2.3.2. Eating Disorders Examination—Questionnaire version (Fairburn & Beglin, 1994)

The EDE-Q is a 36-item, self-report measure of disordered eating, which is scored on a 7-point scale. The measure assesses the

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1 Subjects were recruited as part of a larger investigation on genetics and personality traits among BN, reported elsewhere (Wunderlich et al., 2005).
presence and frequency of behavioral and cognitive symptoms over the past 28 days, yielding a global score along with four subscale scores (Eating Restraint, Eating Concerns, Weight Concerns, and Shape Concerns). Research demonstrates that the EDE-Q is a reliable and valid measure of problematic eating, with good discriminant and concurrent validity compared to the clinician-administered Eating Disorders Examination (Mond, Hay, Rodgers, Owen, & Beumont, 2004; Wilfley, Schwartz, Spurrell, & Fairburn, 1997). The EDE-Q global score was used for primary analyses.

2.3.3. Frost Multidimensional Perfectionism Scale (Frost et al., 1990)

The FMPS is a 35-item questionnaire designed to assess perfectionism. This measure yields a global score, which provides a general index of perfectionism. It also yields six subscale scores (Concern over Mistakes, Personal Standards, Parental Expectations, Parental Criticism, Doubts about Actions, and Organization). The FMPS has demonstrated adequate reliability and validity (Frost et al., 1990). The FMPS total score was used for primary analyses.2

2.3.4. Inventory for depressive symptomatology-self report (Rush et al., 1986)

The IDS-SR is a 30-item rating scale designed to measure the presence and severity of depressive symptoms. Scores range from 0 to 84, with higher scores representing greater symptom severity. Research has demonstrated that the IDS-SR is a valid and reliable measure of depressive symptomatology (Rush, Guillion, Basco, Jarrett, & Trivedi, 1996; Rush et al., 1986).

2.4. Data analytic plan

Hierarchical regression analyses were employed to test study predictions. Given the high rate of depression among those with ED and OCD (Fornaria et al., 1992; Laessle, 1987; Rasmussen & Eisen, 1992; Weissman et al., 1994), all hypothesized effects existed. IDS total scores were used as a covariate in each analysis; this was expected to provide a more stringent test of the proposed symptom relationships. A Sobel test (Kenny et al., 1998; Preacher & Hayes, 2004) was conducted to determine whether perfectionism mediated the relationship between ED and OC symptoms.

3. Results

3.1. Descriptive statistics

Intercorrelations between measures are presented in Table 1. Descriptive statistics and diagnostic information are displayed in Table 2.

2 According to past research (Frost et al., 1990), the MOCI Doubting Subscale has overlap with the FMPS-DA subscale. For all analyses involving the FMPS and MOCI, we therefore removed the FMPS-DA subscale items from the FMPS total score. This data-analytic approach has been suggested elsewhere (Shafran & Mansell, 2001).
and treatment of these disorders (Miguel et al., 2005). Egan, Wade, specifically important construct to assess in the presence, prevention, among BN and EDNOS. Steele and Wade (2008) showed that cogni-
findings point to the treatment of perfectionism among BN specif-
tential importance as a treatment target across disorders. Our
and Shafran (2011) recently provided an elegant review of perfec-
variable in ED and OC symptoms (Cassidy et al., 1999). Previous re-
that perfectionism may serve as a shared personality or cognitive
neurotic disorder, and it may be that specific symptoms and
symptom dimensions are more strongly associated with ED and
perfectionism. Finally, increasing evidence suggests that consid-
ary variation exists in the stability and classification of ED diagno-
s (Fairburn & Harrison, 2003; Milos et al., 2002). Preliminary longitudinal research suggests that personality factors may help
to predict diagnostic crossover among those with ED (Tozzi et al.,
In view of these findings, perfectionism may be a clinically
informative etiological personality factor to investigate in the diag-
nostic stability ED and OCD, and the neurobiology and pathogene-

References


Table 2
Descriptive statistics and diagnostic information.

<table>
<thead>
<tr>
<th></th>
<th>Overall ED Subcategories</th>
<th>Clinical BN (Non Purging)</th>
<th>Clinical BN (Purging)</th>
<th>Subclinical BN</th>
<th>Subjective BN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
</tr>
<tr>
<td>MOCl Total Score</td>
<td>8.0 (5.4)</td>
<td>8.7 (1.2)</td>
<td>8.1 (5.5)</td>
<td>6.3 (4.0)</td>
<td>9.3 (5.9)</td>
</tr>
<tr>
<td>Washing</td>
<td>2.2 (2.1)</td>
<td>2.0 (2.1)</td>
<td>2.3 (2.1)</td>
<td>1.7 (1.9)</td>
<td>2.4 (2.1)</td>
</tr>
<tr>
<td>Checking</td>
<td>3.9 (2.1)</td>
<td>2.3 (1.2)</td>
<td>2.0 (2.3)</td>
<td>1.1 (1.4)</td>
<td>2.2 (2.0)</td>
</tr>
<tr>
<td>Doubting</td>
<td>3.0 (1.8)</td>
<td>3.0 (2.5)</td>
<td>2.9 (1.8)</td>
<td>2.3 (1.3)</td>
<td>3.7 (1.9)</td>
</tr>
<tr>
<td>Sloppiness-Repetition</td>
<td>2.8 (1.1)</td>
<td>3.0 (0.8)</td>
<td>2.7 (1.1)</td>
<td>3.3 (1.0)</td>
<td>2.6 (1.1)</td>
</tr>
<tr>
<td>EDE-Q global score</td>
<td>4.2 (1.9)</td>
<td>4.3 (1.3)</td>
<td>4.3 (2.2)</td>
<td>3.7 (1.1)</td>
<td>4.2 (0.8)</td>
</tr>
<tr>
<td>Eating Restraint</td>
<td>3.9 (1.2)</td>
<td>3.8 (1.7)</td>
<td>4.0 (1.1)</td>
<td>3.0 (1.1)</td>
<td>4.1 (1.1)</td>
</tr>
<tr>
<td>Eating Concerns</td>
<td>3.5 (1.3)</td>
<td>3.7 (1.6)</td>
<td>3.9 (1.2)</td>
<td>2.9 (1.3)</td>
<td>3.4 (1.1)</td>
</tr>
<tr>
<td>Weight Concerns</td>
<td>4.3 (1.2)</td>
<td>4.8 (1.7)</td>
<td>4.3 (1.2)</td>
<td>4.2 (1.4)</td>
<td>4.5 (1.1)</td>
</tr>
<tr>
<td>Shape Concerns</td>
<td>4.6 (1.1)</td>
<td>5.1 (1.1)</td>
<td>4.6 (1.1)</td>
<td>4.5 (1.1)</td>
<td>5.0 (0.7)</td>
</tr>
<tr>
<td>FMPS global score</td>
<td>120.9 (20.6)</td>
<td>122.2 (25.4)</td>
<td>121.5 (20.4)</td>
<td>115.6 (20.5)</td>
<td>124.1 (21.5)</td>
</tr>
<tr>
<td>Concern over Mistakes</td>
<td>31.1 (7.2)</td>
<td>31.0 (9.0)</td>
<td>31.1 (7.2)</td>
<td>29.2 (7.4)</td>
<td>32.0 (6.7)</td>
</tr>
<tr>
<td>Personal Standards</td>
<td>26.1 (5.5)</td>
<td>24.2 (4.4)</td>
<td>26.3 (5.3)</td>
<td>24.7 (5.6)</td>
<td>26.5 (6.2)</td>
</tr>
<tr>
<td>Parental Expectation</td>
<td>15.5 (4.7)</td>
<td>16.0 (5.3)</td>
<td>15.6 (4.3)</td>
<td>14.7 (5.9)</td>
<td>15.9 (5.3)</td>
</tr>
<tr>
<td>Parental Criticism</td>
<td>11.3 (4.4)</td>
<td>13.5 (4.0)</td>
<td>11.3 (4.1)</td>
<td>10.5 (4.8)</td>
<td>11.7 (4.9)</td>
</tr>
<tr>
<td>Doubts about Actions</td>
<td>12.8 (3.4)</td>
<td>12.5 (3.6)</td>
<td>12.9 (3.5)</td>
<td>12.1 (3.3)</td>
<td>12.7 (3.4)</td>
</tr>
<tr>
<td>Organization</td>
<td>23.6 (4.8)</td>
<td>24.2 (5.6)</td>
<td>23.5 (5.0)</td>
<td>23.5 (3.9)</td>
<td>24.5 (4.5)</td>
</tr>
<tr>
<td>IDS total score</td>
<td>25.0 (12.8)</td>
<td>39.0 (12.1)</td>
<td>30.6 (12.8)</td>
<td>25.6 (12.7)</td>
<td>27.5 (12.3)</td>
</tr>
</tbody>
</table>

Note: MOCl = Maudsley Obsessive–Compulsive Inventory; EDE-Q = Eating Disorders Examination Questionnaire; FMPS = Frost Multidimensional Perfectionism Scale; IDS = Inventory for Depressive Symptoms.


