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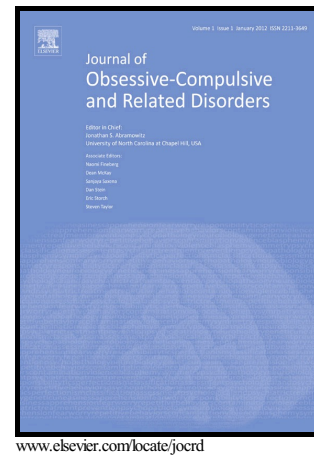
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BODY DYSMORPHIC DISORDER AND QUALITY OF LIFE

Body Dysmorphic Disorder Symptoms and Quality of Life: The Role of Clinical and Demographic Variables

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Abstract

Body dysmorphic disorder (BDD) is associated with low quality of life (QOL) in clinical samples. It is unclear whether QOL is also associated with BDD symptoms in non-clinical samples, and if so, whether related demographic or clinical variables may also be associated with QOL. Questionnaires were used to assess demographics, QOL, and symptoms of BDD, depression, anxiety, obsessive-compulsive disorder (OCD), eating disorders, and alcohol use disorder in 399 undergraduate students with appearance concerns. Lower QOL was associated with higher symptoms of BDD, anxiety, OCD, and eating disorders, a greater number of body areas of concern, and female gender. In multivariate analysis, QOL was associated with symptoms of depression, BDD, and OCD. Depression and OCD may be particularly important for understanding the association between QOL and BDD, consistent with the strong relationship observed between these disorders in clinical samples.

BODY DYSMORPHIC DISORDER AND QUALITY OF LIFE

Keywords

Keywords: body dysmorphic disorder; quality of life; depression; obsessive-compulsive disorder; university sample

Introduction

Body dysmorphic disorder (BDD) is an obsessive-compulsive spectrum disorder involving excessive preoccupation with slight or imagined defects in appearance (American Psychiatric Association, 2013). BDD affects approximately 1.9% of the general population (Veale, Gledhill, Christodoulou, & Hodsoll, 2016), and causes significant distress and impairment (Phillips, Menard, Fay, & Weisberg, 2005). In clinical samples, BDD is associated with particularly poor quality of life (QOL), that is, low satisfaction in key life domains such as mental and physical health, relationship quality, and role functioning (IsHak et al., 2012). Mental health-related QOL is lower in BDD compared to obsessive-compulsive disorder (OCD), bipolar disorder, and schizophrenia (Phillips, Menard, Fay, & Pagano, 2005). Further, BDD is associated with lower body image-related QOL than anorexia nervosa, bulimia nervosa, or other psychiatric patients (Hrabosky et al., 2009). However, given the significant barriers to BDD diagnosis (Marques, Weingarden, LeBlanc, & Wilhelm, 2011; Veale, Akyüz, & Hodsoll, 2015), it is likely that participants in BDD clinical samples experience particularly severe illness and associated impairment. Research in non-clinical analogue samples is needed to determine whether the association between BDD symptoms and QOL is also present across a broad range of BDD severity (Abramowitz et al., 2014). Further, it is important to determine whether any

BODY DYSMORPHIC DISORDER AND QUALITY OF LIFE

association between QOL and BDD is driven by BDD symptom severity, or by other variables which may be related both to BDD and QOL.

University students are a suitable non-clinical population for studying BDD phenomena as BDD prevalence is elevated compared to the general population (weighted BDD prevalence in university students 3.3% vs. general population 1.9%; Veale et al., 2016), and symptoms of BDD are also common (Bartsch, 2007; Liao et al., 2010). Bartsch (2007) found that the presence of probable BDD (meeting questionnaire screening criteria for BDD without a confirmed diagnosis) was associated with lower QOL in Australian university students. However, the study did not examine other variables that may also be associated with QOL. A review of QOL in BDD suggested that comorbid disorders may be of particular importance for understanding QOL (IsHak et al., 2012). This is especially relevant in light of the high levels of comorbidity found in BDD; major depressive disorder (76.5%), social anxiety disorder (36.5%), OCD (32.1%), alcohol use disorder (20.5%), panic disorder (13.0%), specific phobias (10.2%), and eating disorders (9.9%; Gunstad & Phillips, 2003). As these disorders often co-occur and are independently associated with low QOL (Donovan, Mattson, Cisler, Longabaugh, & Zweben, 2005; Jenkins, Hoste, Meyer, & Blissett, 2011; Olatunji, Cisler, & Tolin, 2007; Rapaport, Clary, Fayyad, & Endicott, 2005), it is important to consider the role of comorbid disorder symptomology when examining QOL in BDD.

Previous research in those diagnosed with BDD supports the notion that variables other than BDD symptom severity are important for understanding QOL. In a series of studies examining clinical correlates of BDD in a large clinical sample, poorer QOL was associated with the presence of current major depressive disorder (Phillips, Didie, & Menard, 2007). However

BODY DYSMORPHIC DISORDER AND QUALITY OF LIFE

QOL did not differ by sex (Phillips, Menard, & Fay, 2006), between adolescents and adults (Phillips, Didie, et al., 2006), or between those with and without comorbid OCD (Didie et al., 2007), eating disorders (Ruffolo, Phillips, Menard, Fay, & Weisberg, 2006), or substance use disorders (Grant, Menard, Pagano, Fay, & Phillips, 2005). In a different BDD sample, multivariate analysis found that lower QOL was predicted by higher BDD and depression symptoms, a higher number of body areas of concern, higher age, female gender, lack of private health insurance, and current BDD treatment (Marques, LeBlanc, et al., 2011). Anxiety severity, ethnicity, and marital status were not significant predictors in the multivariate analysis, despite significant bivariate associations with QOL. Therefore, it is important to examine the association of a range of demographic and clinical variables with QOL, and to use multivariate analyses to determine which variables are most strongly associated with QOL.

The aim of the current study was to examine the association between QOL and BDD and associated demographic and clinical features in a sample of university students with appearance concerns. The variables selected for analysis were clinical features; the severity of symptoms of depression, anxiety, OCD, eating disorders, alcohol use disorder, and the number of body areas of concern, and demographic features; age, gender, cultural background, dating status, and employment status. We sought to determine 1) the strength of the association between QOL and BDD, and 2) which variables significantly predicted QOL in a multivariate analysis.

BODY DYSMORPHIC DISORDER AND QUALITY OF LIFE

Method**Participants**

Participants were Australian undergraduate psychology students who responded to an online questionnaire about the impact of comorbid symptoms on quality of life in those with appearance concerns. Participants received course credit for their involvement in the research. Participants provided informed consent using an online consent form. The Human Research Ethics Committee of Macquarie University approved the research. There were 506 responses to the questionnaire; 44 (8.7%) were excluded as they responded 'no appearance concerns' to the BDD questionnaire screening item (see below), and 62 (12.2%) were excluded due to incomplete responses. This left 400 responses (79.1%) included in the current study.

Of these 400 participants, 308 (77.0%) were female, the mean age was 19.63 years ($SD = 4.12$, range 17 – 46), 168 (42.0%) were in a romantic relationship, and 285 (71.3%) were employed (casual, part-time, or full-time). English was the main language spoken at home by 340 (85.0%), and the most commonly identified cultural backgrounds were Oceanian (e.g., Australian, New Zealander, Pacific Islander; $n = 193$, 48.3%), Asian ($n = 91$, 22.8%), and European ($n = 73$, 18.3%).

Measures

QOL was assessed using the Quality of Life Enjoyment and Satisfaction Questionnaire-Short Form (QLES-SF; Endicott, Nee, Harrison, & Blumenthal, 1993), which includes 16 items assessing physical and emotional health, relationships with others, and daily activities over the past week. Items are scored from 1 (very poor) to 5 (very good). The first 14 items are summed to form a total score, which is then converted to a percentage maximum score ranging from 0

BODY DYSMORPHIC DISORDER AND QUALITY OF LIFE

(lowest possible QOL) to 100 (highest possible QOL). The QLES-SF has good internal consistency (Cronbach's $\alpha = .86$), meaningful associations with clinical severity, and provides information over and above measures of illness severity (Endicott et al., 1993; Wyrwich et al., 2009). In the current study, internal consistency was good ($\alpha = .86$).

BDD symptom severity was assessed using the Cosmetic Procedure Screening Questionnaire (COPS; Veale et al., 2012). It is designed to measure BDD symptoms and identify probable cases of BDD, and has been used in clinical and community samples (Krebs et al., 2017; Veale, Eshkevari, et al., 2014). It begins with a screening item for appearance concerns and asks the participant to describe their top 5 appearance concerns. It then includes 9 symptom items assessing current BDD symptoms such as appearance-related compulsions, evaluation of appearance, and associated interference. Items are scored from 0-8 (3 items are reverse-scored) and are combined to form a severity score from 0–72. The COPS demonstrates good internal consistency ($\alpha = .91$) and test-retest reliability ($\alpha = .87$), and a score ≥ 40 indicates possible BDD (Veale et al., 2012). In the current study, internal consistency was good ($\alpha = .87$).

The Depression Anxiety Stress Scales – 21 Item Version (DASS-21; Lovibond & Lovibond, 1995) was used to assess symptoms of depression (DASS-D; hopelessness, anhedonia, and inertia) and state anxiety (DASS-A; anxious affect and somatic sensations of anxiety) over the past week. The DASS-D and DASS-A each include 7 items scored from 0 (did not apply to me at all) to 3 (applied to me very much, or most of the time). Scores are summed and then doubled to allow consistency with the original 42-item version of the DASS, so each subscale ranges from 0–42. The DASS-21 demonstrates good internal consistency (DASS-D: $\alpha = .83$ –.88, DASS-A: $\alpha = .78$ –.82) and strong convergent and divergent validity (Henry & Crawford, 2005; Norton,

BODY DYSMORPHIC DISORDER AND QUALITY OF LIFE

2007). Participants were categorized as having elevated symptom levels if they scored in the severe or extremely severe range (DASS-A ≥ 15 , DASS-D ≥ 21 ; Lovibond & Lovibond, 1995). In the current study, internal consistency was good for the DASS-D ($\alpha = .90$) and DASS-A ($\alpha = .83$).

Although the DASS-A assesses anxiety symptoms, it does not specifically evaluate symptoms of social anxiety, which has a close association with BDD (Kelly, Walters, & Phillips, 2010). Interaction-related social anxiety was assessed using the Social Interaction Anxiety Scale (SIAS-6), and performance-related social anxiety was assessed using the Social Phobia Scale (SPS-6; Peters, Sunderland, Andrews, Rapee, & Mattick, 2012). These companion measures each include 6 items scored from 0 (not at all characteristic or true for me) to 4 (extremely characteristic or true of me). The measures have good convergent validity and internal consistency (SIAS-6 $\alpha = .72-.84$, SPS-6 $\alpha = .84-.87$; Carleton et al., 2014; Peters et al., 2012). A diagnosis of social anxiety disorder is suggested if SIAS-6 ≥ 7 or SPS-6 ≥ 2 (Peters et al., 2012). Internal consistency was good for the SIAS-6 ($\alpha = .87$) and SPS-6 ($\alpha = .91$).

Symptoms of OCD over the past month were assessed using the Florida Obsessive-Compulsive Inventory (FOCI; Storch et al., 2007). Part A assesses the presence of 20 obsessions and compulsions. Those with any current symptoms complete part B, which includes 5 items scored from 0–4 assessing the duration, distress, and impairment of OCD symptoms. Participants who do not endorse any OCD symptoms in part A are given an automatic score of 0 for part B. The current study utilized the OCD severity items from part B, which has good internal consistency ($\alpha = .86-.89$), and convergent and divergent validity (Aldea, Geffken, Jacob, Goodman, & Storch, 2009; Storch et al., 2007). Clinically significant OCD is indicated by a part B severity score ≥ 8 (Storch E. A., personal communication, 2nd June 2017). Current study internal

BODY DYSMORPHIC DISORDER AND QUALITY OF LIFE

consistency was good ($\alpha = .88$).

Eating disorder symptoms were assessed using the Eating Attitudes Test – 26 Item Version (EAT-26; Garner, Olmsted, Bohr, & Garfinkel, 1982), which assesses symptoms such as purging, oral control, and food preoccupation. Items are scored from 0 (never, rarely, or sometimes) to 3 (always). The EAT-26 has good internal consistency in non-clinical and eating disorder populations ($\alpha = .83-.90$), and total scores ≥ 20 suggest the presence of clinically significant eating disorder pathology (Garner et al., 1982; Mintz & O'Halloran, 2000). Internal consistency in the current study was good ($\alpha = .91$).

The Alcohol Use Disorders Identification Test (AUDIT; World Health Organization, 2001) was used to assess symptoms of hazardous and harmful alcohol use, and alcohol dependence. It includes questions about recent patterns of use, as well as negative drinking-related consequences over the past year. It includes 10 items scored from 0–4, and a total score ≥ 8 indicates hazardous and harmful alcohol use (World Health Organization, 2001). In the current study, internal consistency was good ($\alpha = .85$).

Participants completed basic demographic questions and were asked to specify all of their body areas of concern.

Data Analysis

We examined bivariate associations between QOL and other variables using correlations, independent samples t-tests, and one-way ANOVAs. We then conducted a hierarchical linear regression with BDD symptoms as the first step, and all other demographic and clinical variables bivariately associated with QOL added as a second step. Alpha was set at 0.05 with two-tailed analyses, and corrections for multiple comparisons were not employed

BODY DYSMORPHIC DISORDER AND QUALITY OF LIFE

due to the exploratory nature of the analyses and the lack of focus on a universal null hypothesis (Armstrong, 2014; Perneger, 1998). SPSS version 24 was used to conduct all analyses.

Initial data screening for regression analyses indicated a potentially influential outlier, with a standardized residual of 5. Examination of the response suggested careless responding, with the same low or high-scoring answer selected across each questionnaire and very quick response times. This suggested that it was not a genuine response, so we excluded it from further analysis. In the final sample of 399 participants, all assumptions of hierarchical linear regression were met (independence of observations, linearity of relationships, homoscedasticity, no influential outliers, no high leverage points or influential points, and normality of errors). Although two pairs of variables were moderately and significantly correlated (SIAS-6 with SPS-6 $r = .70$, DASS-D with DASS-A $r = .65$), all variables had acceptable tolerance values (≥ 0.417). We ran analyses with and without each of these pairs of variables, and there were no systematic or meaningful changes in model parameters. As these associations did not indicate multicollinearity, we retained all variables in the analysis.

Results

Bivariate Analyses

Table 1 presents descriptive data of continuous variables (mean, standard deviation, and range of scores), the percentage of participants with elevated scores, and the association of each variable with QOL. There were significant negative correlations between QOL and symptoms of BDD, depression, anxiety, interaction-related and performance-related social

BODY DYSMORPHIC DISORDER AND QUALITY OF LIFE

anxiety, OCD, eating disorders, and the number of body areas of concern. There was no significant correlation between QOL and symptoms of alcohol use disorder.

QOL was not significantly associated with age ($r = -.01, p = .900$), dating status ($t = -0.34, p = .733$), employment status ($t = -0.29, p = .774$), language spoken at home ($F = 0.96, p = .444$), or cultural background ($F = 0.85, p = .563$). However, QOL was significantly higher in males ($M = 61.24, SD = 14.96$) compared to females ($M = 57.04, SD = 15.57; t = 2.29, p = .023$).

Hierarchical Linear Regression Predicting Quality of Life

Table 2 presents the results of the hierarchical linear regression with BDD symptoms entered in the first step, and all other variables with a significant bivariate association with QOL entered in the second step. The final model explained a significantly higher proportion of the variance in QOL compared to BDD symptoms alone. In the final model, significant predictors of QOL were depression, BDD, and OCD. Although BDD remained a significant predictor in the final model, the strongest predictor of QOL was depression symptoms.

Discussion

In this study, we sought to examine the association between QOL and BDD symptoms in an analogue sample of university students with appearance concerns, and to understand the potential associations of QOL with related demographic and clinical features using multivariate analysis. Initial bivariate analyses found that QOL was significantly associated with gender, the number of body areas of concern, and symptoms of BDD, OCD, depression, anxiety, interaction- and performance-related social anxiety, and eating disorders. This is broadly consistent with previous research on QOL in clinical BDD samples and from research on related disorders (Jenkins et al., 2011; Marques, LeBlanc, et al., 2011; Olatunji et al., 2007; Rapaport et al., 2005).

BODY DYSMORPHIC DISORDER AND QUALITY OF LIFE

QOL was not significantly correlated with alcohol use disorder symptoms, which is in contrast to previous clinical research (Donovan et al., 2005). There was no bivariate association between QOL and participant age, dating status, employment status, the main language spoken at home, or cultural background. Age, ethnicity, and employment status were associated with QOL in a sample of adults with BDD (Marques, LeBlanc, et al., 2011). These inconsistent findings may reflect differences in BDD symptom severity, or differences in study populations; participants from Marques, LeBlanc, et al. (2011) were older, and differed in ethnicity compared to the current study.

In the first step of the hierarchical linear regression, BDD symptoms explained 20% of the variance in QOL. This is similar to QOL variance explained by disorder symptoms in clinical samples with depressive disorders and higher than explained QOL variance in OCD and social anxiety disorder (Rapaport et al., 2005). Adding the second step including gender, the number of body areas of concern, and other disorder symptoms explained an additional 23% of the variance in QOL. In the final model, significant predictors of QOL were symptoms of depression, BDD, and OCD. Depression symptoms were the strongest predictor of QOL in the full model, which is consistent with clinical BDD samples where QOL is associated with depression symptoms and diagnostic status (Marques, LeBlanc, et al., 2011; Phillips et al., 2007). The only prior study to examine the relationship between OCD and QOL in BDD found that QOL did not differ between those with and without comorbid OCD (Didie et al., 2007), suggesting that the severity of current OCD symptoms may be more closely related to QOL than the simple presence or absence of the disorder.

BODY DYSMORPHIC DISORDER AND QUALITY OF LIFE

The findings indicate that although lower QOL is associated with higher BDD symptoms, symptoms of depression had the strongest association with QOL, followed by BDD and OCD symptoms. Studies examining QOL in BDD should further examine the role of depression and OCD symptoms, which are also closely associated with BDD in clinical samples (Frías, Palma, Farriols, & González, 2015; Gunstad & Phillips, 2003). Not only are rates of comorbid depression and OCD high in those with BDD (Gunstad & Phillips, 2003), but symptoms of the disorders are longitudinally associated such that improvement in OCD and depression predict improvement in BDD and improvement in BDD predicts improvement in depression, but not OCD (Phillips & Stout, 2006). Given that improving QOL is increasingly recognized as an essential goal of mental health treatment (Lam, Parikh, Michalak, Dewa, & Kennedy, 2015), future research should determine whether QOL improvement following BDD treatment (Krebs et al., 2017; Veale, Anson, et al., 2014) can be enhanced by concurrent targeting of depression and OCD symptoms. It could also consider whether addressing transdiagnostic vulnerability factors such as intolerance of uncertainty or shame would improve QOL outcomes following treatment (Summers, Matheny, Sarawgi, & Cogle, 2016; Weingarden, Renshaw, Wilhelm, Tangney, & DiMauro, 2016). Overall, the results of the current study highlight the importance of depression in understanding the clinical presentation of BDD, and suggests that efforts to improve QOL in BDD should focus on improving symptoms of depression.

It is important to recognize some limitations to the current study. Self-report questionnaire measures are less reliable than interview methods, and may lead to false-positive questionnaire response for BDD, for example, if appearance concerns are due to real physical differences. Further, symptoms of BDD can overlap with symptoms of eating disorders

BODY DYSMORPHIC DISORDER AND QUALITY OF LIFE

(Mitchison, Crino, & Hay, 2013), and further measurement development work is needed to create or refine questionnaires to better discriminate between these disorders. Further, the measures selected varied in the timeframe used to capture symptoms; it may be more valuable to standardize the window in which symptoms of different disorders are assessed. Our sample of university students was selected as an analogue sample to explore the association of QOL and BDD, but it would be valuable to extend the research to clinical samples. The sample was predominantly female and there were too few participants to conduct the analyses separately for males and females. Further research is needed to determine whether associations between QOL and BDD may differ by gender. Although QOL is often viewed as an outcome of psychopathology, bidirectional associations have been observed between symptoms of eating disorders and health-related QOL (Mitchison, Morin, Mond, Slewa-Younan, & Hay, 2015). Longitudinal studies will be particularly valuable in addressing questions of directionality and patterns of QOL or symptom exacerbation.

Conclusions

Lower QOL is associated with higher BDD symptoms in a university sample with appearance concerns. Although multivariate analysis found that depression, BDD, and OCD were significantly associated with QOL, depression had the strongest association to QOL in the regression model. These findings highlight the importance of considering the impact of comorbid symptoms on QOL, especially depression, and suggest that studies seeking to examine or improve QOL in those with BDD should also consider the role of depression and OCD.

BODY DYSMORPHIC DISORDER AND QUALITY OF LIFE

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Conflict of Interest

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BODY DYSMORPHIC DISORDER AND QUALITY OF LIFE

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BODY DYSMORPHIC DISORDER AND QUALITY OF LIFE

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Table 1. Continuous Variable Descriptive Statistics and Association with Quality of Life ($n = 399$)

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Quality of Life	-	-	-	-	-	-	-	-	-	-.07
		.45*	.31*	.39**	.63**	.47**	.36**	.38**	.34**	

BODY DYSMORPHIC DISORDER AND QUALITY OF LIFE

Use Disorder

Symptoms

<i>M</i>	58.0	29.8	4.6	4.3	13.9	10.6	7.5	7.7	15.2	6.8
<i>SD</i>	15.5	12.4	2.1	3.9	10.7	9.0	5.5	6.2	13.6	5.9
Range	0-100	3-69	1-21	0-18	0-42	0-42	0-24	0-24	0-75	0-28
% of Sample	-	20.3	-	20.6	24.3	27.6	49.4	82.7	29.1	39.3

* $p < .05$,** $p < .01$.**Table 2. Hierarchical Linear Regression Predicting Quality of Life**

Model	Variables	<i>B</i>	<i>p</i>	<i>SE</i> (<i>B</i>)	95% CI for <i>B</i>		β	Model Summary				
					Lower	Upper		<i>F</i>	<i>p</i>	ΔR^2	<i>p</i>	
1	Constant	74.6	<.000	1.8	71.1	78.2	-	99.0	<.000	.2		
		6	5	1	0	2	-	7	5	0	-	
	Body Dysmorphic Disorder Symptoms	0.56	<.000	0.0	-0.67	-0.45	-	0.4				
2	Constant	76.7	<.000	1.9	73.0	80.5	-	32.4	<.000	.4	.2	<.000
		9	5	2	2	7	-	5	5	3	3	5
	Body Dysmorphic	0.17	.015	0.0	-0.31	-0.03	-	0.1				

BODY DYSMORPHIC DISORDER AND QUALITY OF LIFE

Disorder						4
Symptoms						
	-	.592	1.5	-3.85	2.20	-
Gender	0.82		4			0.0
						2
Number of	-	.787	0.3	-0.80	0.60	-
Body Areas	0.10		6			0.0
						1
Obsessive-	-	.029	0.1	-0.76	-0.04	-
Compulsive	0.40		8			0.1
Disorder						0
Symptoms						
Depression	-	<.000	0.0	-0.84	-0.52	-
Symptoms	0.68	5	8			0.4
						7
Anxiety	-	.461	0.1	-0.26	0.12	-
Symptoms	0.07		0			0.0
						4
Interaction-	-	.484	0.1	-0.41	0.20	-
Related	0.11		6			0.0
Social						4
Anxiety						
Symptoms						
Performanc	0.00	.988	0.1	-0.29	0.29	0.0
e-Related			5			0
Social						
Anxiety						
Symptoms						
Eating	0.01	.217	0.0	-0.10	0.13	0.0

BODY DYSMORPHIC DISORDER AND QUALITY OF LIFE

Disorder	6	1
Symptoms		

Highlights

- Body dysmorphic disorder (BDD) is associated with low quality of life (QOL)
- We examined predictors of QOL in university students with appearance concerns
- QOL was associated with symptoms of BDD, depression and obsessive-compulsive disorder
- Treatments aiming to improve QOL in BDD should also address these disorders