
Þórhildur Ólafsdóttir

Lokaverkefni til MS gráðu í klinískri sálfræði
Sálfræðideild
Heilbrigðísvisindasvið

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Lokaverkefni til MS gráðu í klinískri sálfraði
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Sálfraðideild
Heilbrigðisvísindasvið Háskóla Íslands
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Ritgerð þessi er lokaverkefní til MS gráðu í klinískri sálfræði. Óheimilt að afrita ritgerðina á nokkurn hátt nema með leyfi réthafa.

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Abstract

Little is known about the prevalence and clinical correlates of body dysmorphic disorder (BDD) symptoms in pediatric obsessive-compulsive disorder (OCD). This study estimates the prevalence of BDD symptoms in a sample of children and adolescents with OCD, investigating possible clinical correlates and whether BDD symptoms predict poorer treatment outcomes after cognitive behavioral therapy (CBT). The study included 269 children and adolescents with OCD (DSM-IV), aged 7–17 years, from Denmark, Sweden, and Norway, who were treated with 14 weekly sessions of manualized, exposure-based CBT. OCD symptom severity was assessed with the Children’s Yale-Brown Obsessive-Compulsive Scale (CY-BOCS). BDD symptoms were assessed using the CY-BOCS symptom checklist. Group differences in treatment outcomes were analyzed using linear mixed effect modeling. Twenty-one patients (7.8%) had BDD symptoms. BDD symptoms in young people were associated with older age ($p = 0.003$) and comorbid anxiety disorders were also more prevalent ($p = 0.025$). In addition, young people with BDD symptoms endorsed a greater number of obsessive and compulsive symptoms than did those without BDD symptoms. Having symptoms of BDD did not affect the CBT outcome. The results of the study suggest that CBT for OCD is equally effective for those with and without BDD symptoms.
Obsessive-compulsive disorder (OCD) is a common chronic psychiatric disorder characterized by unwanted reoccurring thoughts (obsessions) and repetitive behavior (compulsions). Obsessions refer to thoughts, urges and/or mental images that cause fear, discomfort and anxiety to the individual. Compulsions, refer to behaviors that the individual feels necessary to perform to relieve the perceived threat associated with the mental images, thoughts or urges (Mattheisen et al., 2014).

OCD childhood population surveys show a prevalence rate of about 1% while the 12-month international prevalence rate for adult OCD is 1.1–1.8% (American Psychiatric Association, 2013; National Collaborating Centre for Mental Health, 2006). Furthermore, OCD in children and adolescents has an extremely high comorbidity rate. Epidemiological studies have demonstrated that up to 78–85% of young people with OCD have a comorbid psychiatric disorder or another psychopathology that may interfere with their diagnosis, assessment and psychiatric treatment (Ivarsson, Melin, & Wallin, 2008; Lewin, Chang, McCracken, McQueen, & Piacentini, 2010).

By contrast, body dysmorphic disorder (BDD) is a psychiatric disorder in which the affected individual has obsessive and intrusive thoughts about a perceived flaw or defect in his or her physical appearance that is not, or only slightly, perceivable by others. BDD is characterized by repetitive behaviors and mental acts in response to the perceived appearance flaw (which may increase or decrease anxiety). Such repetitive behaviors include mirror checking, excessive grooming and reassurance seeking, while mental acts include comparing one’s appearance with those of other people (American Psychiatric Association, 2013). The most common preoccupations concern the skin, hair, nose, eyes, eyelids, mouth, lips, jaw, and chin (National Collaborating Centre for Mental Health, 2006).
Little systematic research has examined the course and prognosis of BDD, and the scarcity of research is exaggerated for adolescents and children, despite the relatively high prevalence rate among young adolescents (1.1% for 12–14 years) and a mean age of onset of 16 years (Bjornsson, Didie, & Phillips, 2010; Schneider, Baillie, Mond, Turner, & Hudson, 2018; Schneider, Turner, Mond, & Hudson, 2016). Schneider et al. (2016) found a 1.7% prevalence rate for BDD in a community sample of children and adolescents. Although milder symptoms developing in adolescence may dissipate over time, more moderate or severe symptoms usually follow a chronic course with increasing comorbidity (National Collaborating Centre for Mental Health, 2006). Unsatisfactory attempts to alter one’s appearance can lead to depression and suicidal tendencies (National Collaborating Centre for Mental Health, 2006). While the clinical presentation of BDD regarding severity, comorbidity and level of impairment is similar between adults and adolescents (Schneider et al., 2016), young people are more likely to have suicidal thoughts/Attempts and poorer insight. Furthermore, those with BDD onset before 18 year report more comorbidity and even higher suicidality than those with adult onset (Schneider et al., 2016).

Like OCD, BDD has been found to have a high comorbidity rate (Frare, Perugi, Ruffalo, & Toni, 2004). According to one of the largest studies of adult BDD, individuals with BDD meet the diagnostic criteria for at least two other disorders throughout their lifetime (Bellino et al., 2006). The most common comorbidities are mood and anxiety disorder, OC spectrum disorders, eating disorders, substance use disorders and personality disorders (Bellino et al., 2006). More importantly, the greater the number of comorbidities, the greater is the impairment among affected individuals (Frare et al., 2004).
Overlap in clinical features

Both OCD and BDD fall under the *Obsessive compulsive and related disorders (OCRD)* category in DSM-5, as they both have similar symptoms across multiple domains but with different phenotypic properties (Hart & Phillips, 2013). Both are characterized by recurrent, time-consuming and intrusive thoughts that cause anxiety and distress. In both disorders, individuals also engage in repetitive, time-consuming behaviors to reduce negative feelings (Hart & Phillips, 2013). Despite these and other similar features, little research has examined the connection, correlates and comorbidity between the two disorders, especially for pediatric OCD and BDD (K. A. Phillips, Dwight, & McElroy, 1998; Katharine A. Phillips et al., 2007). Studies that have compared the prevalence of comorbid BDD in OCD patients have focused on adult samples, finding that the prevalence of comorbid BDD in a sample of adult patients with primary OCD is 8.7–15% compared with 3% in a non-OCD sample (Frare et al., 2004; Frías, Palma, Farriols, & González, 2015). Previous studies of the presence of BDD in primary OCD pediatric samples have produced heterogeneous results, ranging from 3% to 37% (Conceicao Costa et al., 2012).

Studies of comorbid OCD and BDD in young people are scarce. However, the data indicate that children and adolescents with OCD and comorbid BDD tend to be younger than those who only have OCD (Conceicao Costa et al., 2012) and they also have an earlier onset of OC symptoms, greater severity of OCD, depression and anxiety symptoms and poorer insight (Conceicao Costa et al., 2012). Further, the group have a higher rate of suicidal behaviors, depression, anxiety, eating disorders, skin picking, Tourette syndrome and symptoms of the sexual/religious, aggressive and miscellaneous dimensions than patients without comorbid BDD have (Conceicao Costa et al., 2012).
Treatment

Cognitive behavioral therapy (CBT) is the recommended first-line treatment for OCD in children (National Collaborating Centre for Mental Health, 2006; Socialstyrelsen, 2017; Sundhedsstyrelsen, 2016). CBT is also the gold standard for treatment in adults with BDD. However, the literature on examining treatment for children and adolescents with BDD is lacking despite its severity and early onset (Greenberg, Mothi, & Wilhelm, 2016). The same lack of research is true for comorbid BDD in pediatric OCD and BDD symptoms in OCD. Few studies have directly compared the treatment responsiveness of the two disorders. Currently, no treatment outcome research has been conducted on BDD symptoms in OCD whether in adolescent or adult samples (Greenberg et al., 2016). Because of this lack of work, NICE guidelines recommend that for children and adolescents with BDD, the general principles of treatment for pediatric OCD may therefore be relevant as long as the specific elements of BDD are kept in mind during treatment (National Collaborating Centre for Mental Health, 2006).

Barriers to treatment

Although BDD shares many features with OCD and is frequently comorbid with OCD, there is a fundamental difference in how individuals perceive their disorder, which could interfere with the treatment responsiveness of patients. Obsessive thoughts in OCD have an ego-dystonic nature (Frare et al., 2004). Ego-dystonicity has long been acknowledged as one of the main criteria that differentiates obsessional thoughts in OCD from other negative thoughts, such as those found in depression and anxiety disorders (Belloch, Roncero, & Perpina, 2012). Ego-dystonicity refers to the intrusive nature of thoughts that violate the moral values/code of the individual. That is, ego-dystonic thoughts lie outside the realm of thoughts that the individual would expect him- or herself to have (Belloch et al., 2012). This leads individuals to describe their obsessive thoughts as not derived from their own minds but rather being something
extrinsic and intrusive that leads to discomfort and/or anxiety. Individuals therefore often realize the exaggerated and unrealistic character of their intrusive thoughts. Nevertheless, they give rise to considerable emotional distress (Belloch et al., 2012; Frare et al., 2004; National Collaborating Centre for Mental Health, 2006).

In BDD, the preoccupations of individuals seem to be perceived in a more ego-syntonic fashion. Thoughts are experienced as less intrusive and more in line with the individual’s belief system, as individuals take these preoccupations and thoughts about their appearance to be accurate and not distorted (Frare et al., 2004). Many also have self-reference ideas, causing them to believe that other people are frequently noticing their appearance flaw (Katharine A. Phillips et al., 2007). The ego-syntocity of their preoccupations is an expression of the person’s insight into their symptoms, as they do not realize that their perception of themselves is skewed. It is therefore common for individuals with BDD individuals to seek cosmetic treatment instead of psychotherapy (Castle, Rossell, & Kyrios, 2006). This low insight has an undeniably negative effect on psychotherapy as well as leads to a lack of motivation for and compliance with treatment (Summerfeldt, 2006). Conversely, although the ego-dystonic nature of thoughts in OCD also causes individuals great discomfort, they usually have more insight into their disorder, leading them to seek treatment (Selles et al., 2018; Summerfeldt, 2006).

Insight refers to the capability of patients to recognize that their obsessions and compulsions are symptoms rather than necessary or natural thoughts and behaviors (Selles et al., 2018). An estimated 10% of young people with OCD have poor insight (Selles et al., 2018). Furthermore, research has demonstrated that poor insight correlates with younger age, increased OCD severity, impairment, family accommodation, lower intellectual and adaptive functioning and greater depressive symptoms (Selles, 2018). Most importantly, poor or absent insight is also associated with a reduced response across treatment types (Garcia et al., 2010). Despite this, a recent international meta-analysis revealed that insight does not appear to have
a significant impact on CBT treatment among children and adolescents when measured on a continuum (absent, low, fair, good, excellent) rather than as a dichotomous variable (low or high). It also revealed that low insight is associated with higher distress and avoidance among OCD patients (Selles, 2018; Selles et al., 2018). Poor insight is also seen in BDD and is associated with higher suicidality (Abramowitz, McKay, & Storch, 2017). Studies have consistently found that insight is poorer in BDD than in OCD, with 27–60% of BDD patients having delusional beliefs compared with only 2% of OCD patients (Bjornsson et al., 2010; Katharine A. Phillips et al., 2012). It is therefore crucial to understand a young person’s level of insight when considering models for treatment. However, data on insight are scarce (Abramowitz et al., 2017).

The current study

The aims of the present study are to (1) estimate the prevalence of comorbid BDD symptoms in a sample of pediatric OCD outpatients, (2) investigate differences in clinical presentation and symptom severity between OCD patients with and without comorbid BDD symptoms and (3) evaluate whether comorbid BDD symptoms are associated with poorer treatment outcomes of manualized CBT for OCD.

We hypothesize that children with BDD symptoms have lower insight than the group without BDD symptoms. Furthermore, we expect more severe OCD symptoms in the BDD symptom group and higher comorbidity with depression and anxiety. Finally, we expect children and adolescents with BDD symptoms to have poorer outcomes after OCD treatment than the non-BDD group.
Method

Participants
A total of 269 children and adolescents aged 7 to 17 years, recruited from Denmark, Sweden and Norway between September 2008 and June 2012, were included in the Nordic Long-Term Obsessive-Compulsive Disorder Treatment Study (NordLOTS) (Torp, Dahl, Skarphedinsson, Thomsen, et al., 2015). Included patients were referred from community health centers, general practitioners and, in many cases, if their parents contacted the clinics directly, resulting in a representative sample of pediatric patients seeking treatment for OCD. Inclusion criteria were an OCD diagnosis based on the DSM-IV criteria as confirmed by the Kiddie Schedule for Affective Disorders and Schizophrenia (K-SADS-PL) and a Children’s Yale-Brown Obsessive-Compulsive Scale (CY-BOCS) total severity score ≥16. Exclusion criteria, kept to a minimum, included treatment with CBT or effective doses of selective serotonin reuptake inhibitors (SSRIs) six months before the start of the study, the presence of another psychiatric disorder with higher treatment priority assessed by the Clinical Global Impression scale, and having a developmental disorder besides Pervasive Developmental Disorder, Not Otherwise Specified. Patients with the latter were included if OCD was considered to be the primary disorder. Patients with ADHD were allowed if the pharmacological treatment for ADHD had been stabilized at least three months before inclusion. The study rationale and inclusion procedures for the NordLOTS are described in detail elsewhere (Ivarsson et al., 2010; Thomsen et al., 2013).

Informed consent was obtained from all participants and their parents, and the trial was approved by the Norwegian, Swedish, and Danish Committees for Medical and Health Research Ethics and the Medical Products Agencies.
Measures

CY-BOCS:
The CY-BOCS is a semi-structured interview used in the present study by an independent evaluator to evaluate OCD severity and symptom presentation. The scale comprises two parts. The first part is a 74-item symptom checklist assessing a broad range of current and past obsessions and compulsions. The second part, a severity scale, consists of 10 questions (five concerning obsessions and five concerning compulsions) that measures severity on a five-point scale, with a total score ranging from 0 to 40 (Scahill et al., 1997). The CY-BOCS symptom checklist includes one item on body dysmorphic symptoms. If patients currently had a BDD symptom, they were classified as having BDD symptoms in this study.

A score of <16 on the CY-BOCS was used to define a treatment response. This score was originally chosen as it represents mild severity or less and has been used in several previous studies (Scahill et al., 1997). Insight was measured with an item on the CY-BOCS (item 11) based on a Likert scale ranging from 0 = “good insight” to 4 = “poor insight” (Boileau, 2011).

The CY-BOCS has demonstrated reliability and validity in samples of children with OCD. In the NordLOTS, the intra-class correlation coefficients (ICCs) of inter-rater agreement were as follows: obsessions ICC = 0.94 (95% CI 0.85–0.97), compulsions ICC = 0.87 (95% CI 0.67–0.93) and total score ICC = 0.92 (95% CI 0.78–0.97) (Thomsen et al., 2013).

K-SADS-PL:
The K-SADS-PL is a diagnostic, semi-structured interview designed to assess a broad range of child and adolescent mental disorders according to the DSM-IV criteria. The interview comprises an introductory interview, a screening interview and a diagnostic part. Symptoms are scored as “not present,” “possible,” “in remission” and “certain.” The K-SADS-PL showed good inter-rater reliability (98%), good 1–5-week test–retest kappa (0.80) for all included
anxiety diagnoses and good convergent and divergent validity (Jarbin, Andersson, Råstam, & Ivarsson, 2017; Kaufman et al., 1997; Kragh et al., 2019; Lauth et al., 2010; Villabø, Oerbeck, Skirbekk, Hansen, & Kristensen, 2016). This study used present diagnoses classified as “certain.”

**Child Obsessive-Compulsive Impact Scale – Revised (COIS-R):**
The COIS-R is a 33-item self-reported questionnaire designed to assess the psychosocial functioning of children and adolescents at home, in school and in social settings as well as assess how OCD affects such functioning. Parent and child rating versions are available. Scale items are scored on a four-point Likert scale (0 = “not at all,” 1 = “just a little,” 2 = “pretty much,” and 3 = “very much”). The scale has moderate to high internal consistency of $\alpha = 0.92$–0.94 and $\alpha = 0.78$–0.92 for the parent and child versions, respectively (Piacentini, Peris, Bergman, Chang, & Jaffer, 2007; Skarphedinsson et al., 2015).

**Child Behaviour Checklist (CBCL):**
The CBCL is used to evaluate child behavioral and emotional problems as well as social competence. The scale, rated by parents, has 113 items on a three-point scale (0 = “not true,” 1 = “somewhat or sometimes true,” and 2 = “very or often true”). It has been shown to have good psychometric properties across different populations, mean test–retest reliability between 0.95–1.00 and internal consistency from $\alpha = 0.78$ to $\alpha = 0.97$ (Torp, Dahl, Skarphedinsson, Compton, et al., 2015).
The Mood and Feelings Questionnaire (MFQ):
The MFQ is a parent and child rated assessment used to assess symptoms of depression based on the DSM-III-R. The scale comprises 13 items, scored from 0 to 26 (Ancold & Stephen, 1995). The assessment has sound psychometric properties, and the scale’s total score has demonstrated internal consistency of $\alpha = 0.75$ to $\alpha = 0.90$ (Messer, Angold, Costello, & Loeber, 1995; Torp, Dahl, Skarphedinsson, Compton, et al., 2015; Wood, Kroll, Moore, & Harrington, 1995).

Autism Spectrum Screening Questionnaire (ASSQ):
The ASSQ is a questionnaire for parents to rate the presence of autistic symptoms, consisting of 27 items rated on a three-point scale (0 = “no,” 1 = “somewhat,” and 2 = “yes”). The scale’s total score ranges from 0 to 54 and has an internal consistency of $\alpha = 0.86$ (Ehlers & Gillberg, 1993). The instrument has been proven a reliable and valid tool for screening in both clinical and general populations (Ehlers, Gillberg, & Wing, 1999; Posserud, Lundervold, & Gillberg, 2006). Good internal consistency has been found for the versions in different languages this study used (Arildskov et al., 2016).

Screen for Child-Anxiety-Related Emotional Disorders (SCARED):
The SCARED is a 41-item inventory rated on a three-point Likert-type scale. It is a parent and child rated questionnaire used to measure symptoms of anxiety based on the DSM-IV, scored from 0 to 82. Its total score has demonstrated an internal consistency of $\alpha = 0.92$ for both the child- and the parent-rated versions (Achenbach, 1999; Torp, Dahl, Skarphedinsson, Compton, et al., 2015).
**Treatment**

The treatment protocol included 14 weekly sessions of exposure-based CBT, with each session lasting approximately 75 minutes. In eight sessions, individual therapy was given to the child for 45 minutes, while the remaining time was used with the parents, either alone or with the child. Depending on the child’s age or preference, parents could also join for the whole session. In the remaining six sessions, child and parents were together for the full session. BDD symptoms were treated as other OCD symptoms. Therapists in the study were child and adolescent psychiatrists, clinical psychologists or certified psychotherapists with at least five years of clinical experience (Højgaard et al., 2019). Assessments with the CY-BOCS and K-SADS-PL were conducted by appropriately trained independent evaluators (Thomsen et al., 2013). Parent rating scales were scored by either one or both parents together. Therapy adherence and fidelity were found to be excellent but independent raters were used to assess all outcome measures. The sample and treatment procedure have been described elsewhere (Thomsen et al., 2013).

**Results**

A total of 21 (7.8%) patients reported BDD symptoms on the CY-BOCS symptom checklist. Table 1 shows the baseline demographics, clinical characteristics and group differences. Patients with BDD symptoms were significantly older than those without ($t = 2.994, p = 0.003$). Surprisingly, there was no difference between the level of insight in the two groups. Anxiety disorder was more common in the BDD group than the non-BDD group ($X^2 = 5.039, p = 0.025$). There were no other significant differences between the group with BDD symptoms and the OCD group without, but a trend toward a higher frequency of tic disorders in the BDD symptom group was present ($X^2 = 3.414, p = 0.065$).
Table 1. Baseline demographic, clinical characteristics and group differences.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>BDD symptoms (n=21)</th>
<th>OCD without BDD (n=247)</th>
<th>Group difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, (M (SD))</td>
<td>14.52 (2.06)</td>
<td>12.62 (2.74)</td>
<td>(t=2.994, p=0.003)</td>
</tr>
<tr>
<td>Gender, male (%)</td>
<td>10 (47.6%)</td>
<td>121 (49%)</td>
<td>(X^2=0.015, p=0.904)</td>
</tr>
<tr>
<td>CBT completers</td>
<td>17 (81.0%)</td>
<td>226 (91.5%)</td>
<td>(X^2=2.545, p=0.111)</td>
</tr>
<tr>
<td>Age of OCD onset, (M (SD))</td>
<td>12.17 (3.2)</td>
<td>11.58 (3.0)</td>
<td>(X^2=12.88, p=0.456)</td>
</tr>
<tr>
<td>Baseline OCD severity, (M (SD))</td>
<td>24.29 (5.001)</td>
<td>24.63 (5.109)</td>
<td>(t=-0.295, p=0.738)</td>
</tr>
<tr>
<td>Baseline severity for obsessions, (M (SD))</td>
<td>12.24 (2.6)</td>
<td>12.29 (2.79)</td>
<td>(t=-0.650, p=0.948)</td>
</tr>
<tr>
<td>Baseline severity for compulsions, (M (SD))</td>
<td>12.5 (2.8)</td>
<td>12.36 (2.68)</td>
<td>(t=-0.493, p=0.964)</td>
</tr>
<tr>
<td>Insight (CY-BOCS), (M (SD))</td>
<td>1.29 (0.9)</td>
<td>1.11 (1.0)</td>
<td>(U=2247.0, p=0.327)</td>
</tr>
<tr>
<td>Good/high insight</td>
<td>13 (61.9%)</td>
<td>166 (68%)</td>
<td>(X^2=0.331, p=0.565)</td>
</tr>
<tr>
<td>COIS-R Parent, (M (SD))</td>
<td>21.0 (15.23)</td>
<td>26.12 (18.94)</td>
<td>(U=1574.5, p=0.328)</td>
</tr>
<tr>
<td>COIS-R Child, (M (SD))</td>
<td>20.30 (11.23)</td>
<td>19.88 (14.57)</td>
<td>(U=2172.0, p=0.594)</td>
</tr>
<tr>
<td>CBCL Internalizing, (M (SD))</td>
<td>13.82 (6.79)</td>
<td>15.28 (8.97)</td>
<td>(U=2087.0, p=0.635)</td>
</tr>
<tr>
<td>CBCL Externalizing, (M (SD))</td>
<td>8.83 (10.24)</td>
<td>8.91 (7.65)</td>
<td>(U=2047.5, p=0.524)</td>
</tr>
<tr>
<td>MFQ Parent, (M (SD))</td>
<td>4.84 (4.71)</td>
<td>6.72 (5.60)</td>
<td>(U=1778.5, p=0.146)</td>
</tr>
<tr>
<td>MFQ Child, (M (SD))</td>
<td>6.65 (4.51)</td>
<td>6.42 (4.17)</td>
<td>(U=2248.5, p=0.681)</td>
</tr>
<tr>
<td>ASSQ Total, (M (SD))</td>
<td>7.33 (6.98)</td>
<td>7.21 (6.96)</td>
<td>(U=2474.0, p=0.990)</td>
</tr>
<tr>
<td>ASSQ Motor/ticks/OCD, (M (SD))</td>
<td>2.90 (2.16)</td>
<td>2.70 (2.47)</td>
<td>(U=2279.5, p=0.539)</td>
</tr>
<tr>
<td>ASSQ Autistic style, (M (SD))</td>
<td>1.61 (2.61)</td>
<td>1.51 (1.94)</td>
<td>(U=2423.0, p=0.809)</td>
</tr>
<tr>
<td>ASSQ Social difficulties, (M (SD))</td>
<td>2.28 (2.95)</td>
<td>2.63 (3.39)</td>
<td>(U=2325.5, p=0.610)</td>
</tr>
<tr>
<td>SCARED Parent, (M (SD))</td>
<td>18.71 (12.02)</td>
<td>20.75 (13.47)</td>
<td>(U=2284.0, p=0.614)</td>
</tr>
<tr>
<td>SCARED Child, (M (SD))</td>
<td>23.61 (12.86)</td>
<td>23.61 (11.06)</td>
<td>(U=2111.5, p=0.326)</td>
</tr>
<tr>
<td>Co-morbid disorders (KSADS-PL), (n (%))</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Depressive disorders</strong></td>
<td>1 (4.8%)</td>
<td>9 (3.6%)</td>
<td>(X^2=0.065, p=0.798)</td>
</tr>
<tr>
<td><strong>Anxiety disorders</strong></td>
<td>8 (38.1%)</td>
<td>44 (17.9)</td>
<td>(X^2=5.039, p=0.025)</td>
</tr>
<tr>
<td><strong>Tic disorders</strong></td>
<td>7 (33%)</td>
<td>42 (17%)</td>
<td>(X^2=3.414, p=0.065)</td>
</tr>
<tr>
<td><strong>ODD/CD</strong></td>
<td>1 (4.8%)</td>
<td>9 (3.7%)</td>
<td>(X^2=0.065, p=0.798)</td>
</tr>
<tr>
<td><strong>ADHD</strong></td>
<td>2 (9.5%)</td>
<td>19 (7.7%)</td>
<td>(X^2=0.087, p=0.769)</td>
</tr>
</tbody>
</table>

\(^a\) Independent samples t-test, \(^b\) Pearson’s Chi-square test, \(^c\) Mann–Whitney U test. Significant outcome is marked with bold; OCD = Obsessive-Compulsive Disorder; M = Mean; SD = Standard Deviation; CY-BOCS = Children’s Yale-Brown Obsessive-Compulsive Scale; COIS-R = The Child Obsessive-Compulsive Impact Scale; CBCL = Child Behavior Checklist; MFQ = The Moods and Feelings Questionnaire; ASSQ = Autism Spectrum Screening Questionnaire; SCARED = Screen for Child-Anxiety-Related Emotional Disorders; KSADS-PL = Kiddie Schedule for Affective Disorders and Schizophrenia; ODD = Oppositional Deviant Disorder; CD = Conduct Disorder; ADHD = Attention Deficit Hyperactivity Disorder.
There was a significant difference between the two groups on almost every OCD symptom category except for sexual and magical obsessions, along with counting compulsion. BDD symptoms had an increased rate of OC symptoms compared with those without BDD symptoms (Table 2).

**Table 2. Differences in OCD symptoms, n (%)**

<table>
<thead>
<tr>
<th>CY-BOCS symptom category</th>
<th>OCD with BDD (n= 21)</th>
<th>OCD without BDD (n= 247)</th>
<th>Group difference (Chi-Square, p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contamination Obsessions</td>
<td>20 (95%)</td>
<td>150 (60.7)</td>
<td>(X^2= 9.937, p= 0.002)</td>
</tr>
<tr>
<td>Aggressive Obsessions</td>
<td>18 (85.7%)</td>
<td>134 (54%)</td>
<td>(X^2= 7.907, p= 0.005)</td>
</tr>
<tr>
<td>Sexual Obsessions</td>
<td>4 (19%)</td>
<td>27 (10.9%)</td>
<td>(X^2= 1.265, p= 0.261)</td>
</tr>
<tr>
<td>Magical Obsessions</td>
<td>11 (52.4%)</td>
<td>82 (33.1%)</td>
<td>(X^2= 3.194, p= 0.074)</td>
</tr>
<tr>
<td>Somatic Obsessions</td>
<td>21 (100%)</td>
<td>66 (26.6%)</td>
<td>(X^2= 47.65, p&lt; 0.001)</td>
</tr>
<tr>
<td>Religious Obsessions</td>
<td>12 (57.1%)</td>
<td>51 (20.6%)</td>
<td>(X^2= 14.443, p&lt; 0.001)</td>
</tr>
<tr>
<td>Symmetry Obsessions</td>
<td>12 (57.1%)</td>
<td>85 (34.3%)</td>
<td>(X^2= 4.391, p= 0.036)</td>
</tr>
<tr>
<td>Miscellaneous Obsessions</td>
<td>19 (90.5%)</td>
<td>144 (58.1%)</td>
<td>(X^2= 8.518, p= 0.004)</td>
</tr>
<tr>
<td>Washing Compulsions</td>
<td>21 (100.0%)</td>
<td>167 (67.3%)</td>
<td>(X^2= 9.814, p= 0.002)</td>
</tr>
<tr>
<td>Checking Compulsions</td>
<td>20 (95.2%)</td>
<td>146 (58.9%)</td>
<td>(X^2= 10.837, p= 0.001)</td>
</tr>
<tr>
<td>Repeating Compulsions</td>
<td>16 (76.2%)</td>
<td>120 (48.4%)</td>
<td>(X^2= 5.987, p= 0.014)</td>
</tr>
<tr>
<td>Counting Compulsions</td>
<td>10 (47.6%)</td>
<td>73 (29.4%)</td>
<td>(X^2= 3.000, p= 0.083)</td>
</tr>
<tr>
<td>Symmetry/Ordering Compulsions</td>
<td>13 (61.9%)</td>
<td>93 (37.5%)</td>
<td>(X^2= 4.829, p= 0.028)</td>
</tr>
<tr>
<td>Hoarding Compulsions</td>
<td>11 (52.4%)</td>
<td>49 (19.8%)</td>
<td>(X^2= 11.890, p= 0.001)</td>
</tr>
<tr>
<td>Magical Compulsions</td>
<td>14 (66.7%)</td>
<td>71 (28.6%)</td>
<td>(X^2= 12.960, p&lt; 0.001)</td>
</tr>
<tr>
<td>Involve Others Compulsions</td>
<td>18 (85.7%)</td>
<td>152 (61.3%)</td>
<td>(X^2= 4.966, p= 0.026)</td>
</tr>
<tr>
<td>Mental Compulsions</td>
<td>16 (76.2%)</td>
<td>94 (37.9%)</td>
<td>(X^2= 11.742, p= 0.001)</td>
</tr>
<tr>
<td>Miscellaneous Compulsions</td>
<td>20 (95.2%)</td>
<td>153 (61.7%)</td>
<td>(X^2= 9.492, p= 0.002)</td>
</tr>
</tbody>
</table>

Significant outcome is marked with bold; OCD = Obsessive-Compulsive Disorder; CY-BOCS = Children’s Yale-Brown Obsessive-Compulsive Scale

The observed mean reduction of OCD severity from baseline to post-treatment, measured with the CY-BOCS, was 13.02 (SD = 8.36). The linear mixed effect analysis did not show a significant difference in OCD severity reduction at post-treatment between the groups (\(p = 0.863; 95\% CI -3,4366–4,2154\)) indicating that having BDD symptoms did not affect the CBT outcome (Fig. 1).
Fig. 1. Estimated reduction in OCD groups with and without BDD symptoms during the 14 weeks of CBT

Discussion

The purpose of this study was to examine whether children and adolescents with OCD and BDD symptoms had higher OCD symptom severity, a different clinical presentation or comorbidity pattern and poorer CBT outcomes than those without BDD symptoms.

A total of 21 (7.8%) individuals in our sample reported BDD symptoms. The prevalence of BDD was reported as 2.4% in the general adult population (DSM-5 2013) and 1.7% in a community sample of children and adolescents (Schneider et al., 2016). The 7.8% of individuals reporting BDD symptoms is in the lower range of previous studies of pediatric samples with primary OCD reporting comorbid BDD symptoms ranging from 3% to 37% (Conceicao Costa et al., 2012).
Our data suggest notable group differences in certain demographic factors. Children with BDD symptoms tended to be older than those in the without BDD symptom group. This might be explained by post-pubertal young people being more preoccupied with physical appearance. However, more research is needed to confirm or disconfirm that.

Contrary to earlier findings and our first hypothesis, children with BDD symptoms did not show reduced levels of insight than the without BDD symptom group. However, in the current sample, both groups had relatively high levels of insight. This is not in line with earlier findings indicating that individuals with OCD have better insight into their symptoms than adults with BDD (Bjornsson et al., 2010; Summerfeldt, 2006). However, when comparing the results of this study with those of others, it is worth considering that the current study did not have individuals who had a full diagnosis of BDD, only symptoms.

Further, our findings do not support our second hypothesis, which stated that children with BDD symptoms exhibit worse treatment outcomes than children who only have OCD. In this sample, both groups responded equally well to CBT treatment, which indicates that BDD symptoms do not predict poorer treatment outcomes, at least not in children and adolescent samples. This is not in line with the findings of Summerfeldt (2006), which stated that BDD affects the treatment response. However, as mentioned earlier, the children and adolescents in this sample did not have full diagnoses of BDD, only symptoms, which could explain these results.

Similarly, the analysis of additional comorbid symptoms did not suggest a group difference in comorbid disorders such as depression, ADHD, tic disorder and OCD/CD. In fact, the two groups did not significantly differ in depression; however, anxiety disorders were more frequent in the BDD symptom group.

Children with BDD symptoms endorsed a greater number of OC symptoms than children who did not have any BDD symptoms, especially contamination obsessions (95%
endorsed vs. 60% without BDD symptoms) and washing compulsions (100% endorsed vs. 58% without BDD symptoms). However, no differences were found between groups in sexual and magical obsessions or counting compulsions. These finding are consistent with those of Conceicao Costa et al. (2012).

The strength of this study lies in its large and well-defined sample using a comprehensive assessment of both OCD and comorbidities. CBT treatment was manualized and participants did not receive SSRI medication during CBT treatment.

An important limitation of this study is that BDD symptoms were assessed using the single item in the CY-BOCS checklist. Therefore, we cannot distinguish between milder symptoms of BDD and severe clinical cases, making it difficult to evaluate whether endorsing is a part of young people’s appearance concerns or pathology. Our sample consisted of children and adolescents with OCD and therefore our results cannot extend to children with BDD symptoms without OCD. Finally, the homogeneity of the Scandinavian sample limits the generalizability of its results to more diverse populations.

**Conclusion**

Fewer than 10% of children and adolescents with OCD included in the NordLOTS had symptoms of BDD. Those with BDD symptoms were older, had higher levels of anxiety and endorsed a greater number of OC symptoms than those without BDD symptoms. In contrast to previous studies, the presence of BDD symptoms did not affect insight levels, and the treatment response to CBT was similar for OCD patients with and without BDD symptoms. The present study suggests that OCD can be treated successfully with CBT in the presence of BDD symptoms.
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