Quality of Life in Children and Youth with Obsessive-Compulsive Disorder

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Abstract

Objective: The study examined clinical correlates of quality of life (QoL), impact of treatment on QoL, and predictors of QoL change among children with obsessive-compulsive disorder (OCD).

Methods: One hundred forty-two children with primary OCD who were enrolled as part of a larger clinical trial participated. Children were administered a structured diagnostic interview, as well as clinician-administered measures of OCD and depression symptom severity. Children and parents completed reports of QoL, as well as measures of impairment and internalizing and externalizing symptoms. Youth received 10 sessions of family-based cognitive-behavioral therapy (CBT).

Results: At baseline, QoL was inversely related to obsessive-compulsive symptom severity, impairment, externalizing and internalizing symptoms, and severity of depression symptoms according to children and parents. After CBT, QoL improved according to parent ratings, but not child ratings. None of the predictors examined were associated with changes in QoL scores over time. Impairment, and externalizing and internalizing symptoms predicted QoL after accounting for OCD symptom severity. After accounting for OCD symptoms, externalizing symptoms inversely predicted changes in QoL.

Conclusion: These data suggest that QoL is related to more severe clinical presentation and improves with evidence-based treatment, but QoL improvements may be inversely related to externalizing symptomatology.

Keywords: obsessive-compulsive disorder, quality of life, cognitive-behavioral therapy, assessment, treatment, children, adolescents

Introduction

OBSESSIVE-COMPULSIVE DISORDER (OCD) is an impairing psychiatric condition that affects ~1% to 2% of children and adolescents (Zohar 1999; Canals et al. 2012). Clinical presentation is complicated by the frequent presence of comorbid conditions (Geller et al. 1996; Storch et al. 2008; Skriner et al. 2016), functional impairment across multiple domains (Piacentini et al. 2007), and family embeddedness within the disorder (Wu et al. 2016).

Given the debilitating nature of OCD, investigations have examined its effects on quality of life (QoL). QoL is characterized by how the affected individual (or family member by proxy) perceives the impact of their illness and, if relevant, associated treatment on the patient's physical, mental, and social well-being (Varni et al. 1999). Adults with OCD have lower QoL compared with healthy and clinical controls (Bobes et al. 2001; Rodriguez-Salgado et al. 2006; Stengler-Wenzke et al. 2006). Lower QoL is related to higher

OCD symptom severity (Lochner et al. 2003; Masellis et al. 2003; Sørensen et al. 2004; Rapaport et al. 2005; Eisen et al. 2006; Rodriguez-Salgado et al. 2006) and depressive symptoms (Masellis et al. 2003; Rodriguez-Salgado et al. 2006). QoL improved after cognitive-behavioral therapy (CBT) in adults (Moritz et al. 2005; Diefenbach et al. 2007), and it was predicted by improvements in obsessive-compulsive symptom severity (Diefenbach et al. 2007).

Among children with OCD, QoL is reduced relative to individuals without OCD (Lack et al. 2009). QoL has been inversely related to obsessive-compulsive symptom severity (Lack et al. 2009; Vivan et al. 2013; Wellen et al. 2017), OCD-related functional impairment (De Caluwé and De Clercq 2015; Wellen et al. 2017), internalizing and externalizing symptomatology (Lack et al. 2009), and depressive and anxiety symptoms (Vivan et al. 2013; Wellen et al. 2017). QoL improved after CBT, was associated with treatment response (Weidle et al. 2015; Wellen et al. 2017), and was influenced by neither comorbidity nor family accommodation (Weidle et al. 2015). Further, change in QoL over CBT was

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associated with treatment response but not predicted by baseline comorbidity or family accommodation (Weidle et al. 2015).

Though informative, additional areas need to be investigated to understand QoL among youth with OCD. First, only two studies have examined changes in QoL after treatment (Weidle et al. 2015; Wellen et al. 2017). Symptom reduction is a primary target and goal of intervention, ensuring that such gains translate into improved functioning and life quality is paramount. Second, the role that comorbidity and impairment play in predicting QoL above and beyond obsessive-compulsive severity is unclear. Although some data suggest that obsessive-compulsive symptom severity is directly linked to QoL in this population, it may be that more substantial functional impairment corresponds with reduced QoL beyond obsessive-compulsive symptom severity. It may also be that those who present with more severe comorbidity experience reduced QoL. Should this be the case, more intensive, multimodal treatment may be required to address impairment and/or comorbid conditions that may negatively influence QoL beyond obsessive-compulsive symptom severity.

There were three goals in this study. First, we sought to examine clinical correlates of QoL, including obsessive-compulsive symptom severity, OCD-related functional impairment, depressive symptoms, and internalizing and externalizing symptoms. Consistent with others (Koran et al. 1996; Eisen et al. 2006; Lack et al. 2009), we predicted inverse associations between QoL and each construct of interest. Second, we examined the extent to which QoL would change as a function of exposure-based CBT for OCD, as well as predictors of change in QoL. We expected that QoL would be improved after CBT participation, and that baseline OCD symptom severity, functional impairment, depressive symptoms, and internalizing/externalizing symptoms would be associated with change in QoL. Third, we investigated the contribution of co-occurring baseline internalizing and externalizing symptoms as well as OCD-related functional impairment in predicting baseline QoL while accounting for obsessive-compulsive symptom severity. We expected that internalizing and externalizing symptoms would be associated with QoL above and beyond obsessive-compulsive symptom severity.

Methods

Participants

Participants were 142 children and adolescents (51.4% female) between 7 and 17 years of age [mean = 12.39, standard deviation (SD) = 2.92] who were recruited from two sites [University of South Florida (USF) and Massachusetts General Hospital (MGH)] at part of a clinical trial evaluating the augmentative benefit of D-cycloserine (DCS) ($n = 70$) or placebo ($n = 72$) with exposure-based CBT (Storch et al. 2016). Briefly, participants met the following inclusion criteria: current and primary diagnosis of OCD on a structured clinical interview (Kaufman et al. 1997), a Children's Yale-Brown Obsessive Compulsive Scale (CY-BOCS) Total Score of at least 16 (Scahill et al. 1997), and a full-scale intelligence quotient (IQ) of at least 85 (Wechsler 1999). Exclusion criteria were related to the following: contraindications for DCS (e.g., epilepsy, renal insufficiency, DCS allergy); inability to swallow study medication; active suicidality or suicide attempt in the past year; and co-occurring psychosis, bipolar disorder, autistic disorder, anorexia nervosa, or non-OCD primary hoarding symptoms. Children were also excluded if they initiated an antidepressant or antipsychotic medication within 12 or 6 weeks, respectively, before enrollment, or had an increase in medication dosage before enrollment (8 weeks for antidepressants, 6 weeks for antipsychotics). Any current medication was required to be stable throughout treatment. Further details re-

garding inclusion and exclusion criteria can be found elsewhere (McGuire et al. 2012).

Participating youth were predominately Caucasian ($n = 126$, 89%), had severe OCD symptom severity at baseline (CY-BOCS Total Score: mean = 25.28, SD = 5.98, Range: 12–38), and few were taking serotonin reuptake inhibitors ($n = 42$, 30%), stimulants ($n = 7$, 5%), or antipsychotic medications ($n = 3$, 2%). Youth commonly experienced co-occurring anxiety disorders ($n = 51$, 37%), attention-deficit/hyperactivity disorder ($n = 37$, 26%), and depressive disorders ($n = 21$, 14%).

Measures

Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime. The Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime (K-SADS-PL; Kaufman et al. 1997) is a clinician-administered structured diagnostic interview of *The Diagnostic and Statistical Manual for Mental Disorders, 4th Edition* (DSM-IV) childhood disorders. The K-SADS-PL has demonstrated good test-retest reliability and validity.

Children's Yale-Brown Obsessive Compulsive Scale. The CY-BOCS (Scahill et al. 1997) is a semi-structured clinician-administered interview that assesses the presence and severity of OCD symptoms over the past week. The CY-BOCS Total Score has demonstrated reliability ($\alpha = 0.89$ in the current sample), validity, and treatment sensitivity (Storch et al. 2004, 2010).

Child Depression Rating Scale. The Child Depression Rating Scale (CDRS; Poznanski and Mokros 1996) is a semi-structured clinician-administered scale that assesses the presence and severity of depressive symptoms ($\alpha = 0.85$ in the current sample). The CDRS Total Score has demonstrated good psychometric properties.

Pediatric QoL Scale Parent and Child Report. The Pediatric QoL Scale Parent and Child Report (PedsQL-P/C; Varni et al. 2003) are 23-item parallel parent- and child-rated measures that assess the child's general QoL. Items are rated on a 5-point scale (0–4), with higher scores corresponding to better QoL. Scores are then transformed to a 0–100 scale to facilitate interpretation (e.g., 0 = 100, 2 = 50, 4 = 0). The PedsQL contains four subscales that assess Physical Functioning, Emotional Functioning, Social Functioning, and School Functioning. Validity and reliability data (parent $\alpha = 0.89$, child $\alpha = 0.84$ in the current sample) have been published across multiple clinical presentations in support of the PedsQL in OCD (Lack et al. 2009) and other conditions (Varni and Burwinkle 2006).

Child Obsessive-Compulsive Impact Scale-Parent and Child reports. The Child Obsessive-Compulsive Impact Scale-Parent and Child reports (COIS-P/C; Piacentini et al. 2001) are parallel parent- and child reports of children's functional impairment across multiple domains due to OCD symptoms. Items are rated on a 4-point scale, with higher scores corresponding with greater impairment. A 21-item version of the COIS was used here, with items 1–20 summed to produce the COIS-P/C Total Score. The remaining items assessed perceived impairment across all functional domains (e.g., school, social, and family functioning). The COIS-P/C Total Scores have demonstrated good internal consistency (parent $\alpha = 0.89$, child $\alpha = 0.88$ in the current sample), concurrent validity, and test-retest reliability (Piacentini et al. 2003).

Child Behavior Checklist. The Child Behavior Checklist (CBCL; Achenbach and Rescorla 2001) is a parent-report

questionnaire that assessed the frequency of behavioral and emotional problems over the past 6 months. The CBCL has well-documented psychometric properties ($\alpha=0.84$ in the current sample) and produced two overall scores for internalizing and externalizing behaviors.

Clinical Global Impression of Severity. The Clinical Global Impression of Severity (CGI-Severity; Guy 1976) is a clinician rating of global severity of the illness, with scores ranging from “no illness” to “serious illness.” The CGI-Severity is well validated in treatment studies of youth with OCD (Storch et al. 2010; Skarphedinsson et al. 2017).

Procedures

All study procedures were approved by the institutional review boards at USF and MGH. After explaining study procedures to interested youth and parents, written parental consent and youth assent were obtained. At the baseline assessment, youth and parents were administered the K-SADS-PL to ascertain psychiatric diagnoses. Afterward, clinicians administered the CY-BOCS and CDRS to determine OCD symptom severity and depressive symptoms, respectively. Next, youth (PedsQL and COIS-C) and parents (CBCL and COIS-P) completed rating scales. After completing the baseline assessment, children received three CBT sessions that were focused on psychoeducation, hierarchy development, and cognitive therapy. Before the fourth session in which exposure therapy started, those youth who continued to meet inclusion/exclusion criteria were randomly assigned to receive seven sessions of protocol-driven CBT over the remaining 7 weeks that were paired with either DCS or placebo. The initial four CBT sessions occurred twice weekly, with the last six sessions occurring weekly (see Storch et al. 2016 for further details regarding CBT). Participants were readministered all measures (except the KSADS-PL) at randomization (before fourth CBT session), at the seventh CBT session, and at post-treatment, which was 1 week after the final session. Most youth completed the full course of treatment (98%), with only three youth discontinuing treatment after randomization. After CBT, youth and parents completed a post-treatment assessment that included the clinician-administered CY-BOCS, along with child-report (PedsQL and COIS-C) and parent-report (CBCL and COIS-P) measures. Since there were no group differences in treatment outcome, subsamples were pooled. All clinical evaluators and therapists were blinded to treatment condition (DCS or placebo).

Statistical analysis

Changes in QoL were evaluated for children and parents using multilevel models in SAS Proc Mixed (Littell et al. 2006). For either parent or child, separate models were evaluated for the total QoL score, as well as for the emotional, physical, school, and social subscales. Changes over time were modeled as linear and quadratic effects. For outcomes that exhibited statistically significant changes over time, several predictors of these changes were evaluated, including CY-BOCS total score, CGI-Severity, CDRS total score, COIS-C/P total scores, and CBCL Internalizing and Externalizing scales. A p -value of 0.05 was used; no statistical correction was employed to prevent obscuring of potentially important findings.

Results

Table 1 shows the model estimates for each of the outcomes. As a guide to Table 1, the intercept represents the value of that outcome at baseline, and the linear or quadratic time represents the

TABLE 1. STATISTICAL ANALYSIS OF CHILD AND PARENT QUALITY-OF-LIFE OUTCOMES

	Total	Emotional	Physical	School	Social
Child					
Intercept	73.46***	60.73***	80.36***	67.60***	80.39***
Linear time	0.98	-0.01	0.82	0.65	3.17**
Quadratic time	0.33	0.86	0.29	0.44	-0.37
Parent					
Intercept	72.58***	56.94***	82.39***	64.32***	80.91***
Linear time	-3.42***	-3.59*	-5.10***	0.44	-4.58***
Quadratic time	1.81***	2.34***	2.02***	0.80	1.96***

** $p < 0.01$; *** $p < 0.001$.

extent to which the outcome changed as a function of per unit time or squared units.

Child QoL outcomes

For the child outcomes, only social QoL exhibited statistically significant changes with a significant linear effect of time, but no significant quadratic effect of time. None of the other child-reported QoL outcomes were statistically significant. For the social QoL outcome, treatment group, child age, and child gender were unrelated to scores at baseline or changes over time. Social QoL scores at baseline were inversely related to CY-BOCS total scores ($\beta = -0.84$, standard error (SE) = 0.28, $p = 0.003$), CGI-S scores ($\beta = -4.78$, SE = 1.97, $p = 0.016$), CDRS scores ($\beta = -0.58$, SE = 0.15, $p < 0.001$), COIS-C total scores ($\beta = -0.64$, SE = 0.11, $p < 0.001$), and COIS-P total scores ($\beta = -0.33$, SE = 0.17, $p = 0.049$). Similarly, social QoL scores at baseline were inversely associated with internalizing ($\beta = -0.61$, SE = 0.15, $p < 0.001$) and externalizing subscale scores ($\beta = -0.38$, SE = 0.19, $p = 0.0043$). None of the predictors were associated with changes in QoL scores over treatment.

Parent QoL outcomes

Table 2 displays the estimated means for the parent QoL outcomes. In every case, except for school QoL, results indicated significant improvements across the treatment period as evidenced by the statistically significant linear and quadratic effects of time. For the parent-reported total QoL score, treatment group, child age, and child gender were unrelated to scores at baseline or changes over time. Parent-reported QoL total score was inversely related to baseline total scores on the CY-BOCS ($\beta = -0.68$, SE = 0.19, $p < 0.001$), CGI-S ($\beta = -5.26$, SE = 1.32, $p < 0.001$), CDRS total score ($\beta = -0.59$, SE = 0.10, $p < 0.001$), COIS-C total score ($\beta = -0.54$, SE = 0.11, $p < 0.001$), and COIS-P total score ($\beta = -0.85$, SE = 0.09, $p < 0.001$). None of these predictors were related to changes in QoL total score over treatment. For the CBCL, externalizing scores were inversely related to QoL at baseline ($\beta = -1.03$, SE = 0.15, $p < 0.001$), as well as were linear ($\beta = 0.46$, SE = 0.13, $p < 0.001$) and quadratic ($\beta = -0.12$, SE = 0.04, $p = 0.002$) changes over the treatment period. For internalizing behavior, scores were inversely associated with QoL ($\beta = -1.09$, SE = 0.03, $p < 0.001$), but were unrelated to changes over treatment.

Finally, we examined whether parent-related impairment, internalizing and externalizing symptoms were related to parent-rated child QoL at baseline or to changes over time after accounting

TABLE 2. MEANS AND STANDARD ERRORS FOR QUALITY-OF-LIFE OUTCOMES

<i>Time</i>	<i>Total</i>	<i>Emotional</i>	<i>Physical</i>	<i>School</i>	<i>Social</i>
Child					
Baseline, M $\pm$ SE	73.43 $\pm$ 1.92	60.71 $\pm$ 2.82	80.32 $\pm$ 2.20	67.57 $\pm$ 2.22	80.36 $\pm$ 2.38
Session 4, M $\pm$ SE	74.74 $\pm$ 1.72	61.53 $\pm$ 2.48	81.44 $\pm$ 1.98	68.66 $\pm$ 2.10	73.18 $\pm$ 2.10
Session 7, M $\pm$ SE	76.70 $\pm$ 1.65	64.09 $\pm$ 2.37	83.15 $\pm$ 1.90	70.64 $\pm$ 2.18	85.26 $\pm$ 1.94
Post-treatment, M $\pm$ SE	79.33 $\pm$ 1.74	68.39 $\pm$ 2.54	85.44 $\pm$ 1.98	73.50 $\pm$ 2.46	86.59 $\pm$ 1.94
Parent					
Baseline, M $\pm$ SE	72.57 $\pm$ 1.68	56.93 $\pm$ 2.51	82.39 $\pm$ 1.97	64.30 $\pm$ 2.37	80.92 $\pm$ 2.24
Session 4, M $\pm$ SE	70.96 $\pm$ 1.58	55.66 $\pm$ 2.25	79.29 $\pm$ 1.84	65.54 $\pm$ 2.21	78.30 $\pm$ 2.00
Session 7, M $\pm$ SE	72.98 $\pm$ 1.63	57.09 $\pm$ 2.18	80.25 $\pm$ 1.88	68.40 $\pm$ 2.25	79.62 $\pm$ 1.95
Post-treatment, M $\pm$ SE	78.61 $\pm$ 1.81	67.18 $\pm$ 2.33	85.28 $\pm$ 2.08	72.88 $\pm$ 2.53	84.87 $\pm$ 2.10

Score range = 0–100.

M, mean; SE, standard error.

for obsessive-compulsive symptom severity in the models. Higher COIS-P total scores were related to lower QoL at baseline ($\beta = -0.81$, $SE = 0.09$, $p < 0.001$), but the CY-BOCS total score was not related to baseline QoL scores ($\beta = -0.19$, $SE = 0.16$, $p = 0.238$). Neither the CY-BOCS nor COIS-P total scores were related to changes over time. When the CBCL Internalizing scale was included in the model, higher CBCL Internalizing scores were related to poorer baseline QoL ($\beta = -1.05$, $SE = 0.11$, $p < 0.001$), but the CY-BOCS total score was not significantly related ($\beta = -0.22$, $SE = 0.18$, $p = 0.218$) to baseline QoL. Higher COIS-P total scores were related to linear changes in QoL ($\beta = 0.23$, $SE = 0.11$, $p = 0.044$), but the CY-BOCS total scores were unrelated to changes in QoL over time. Finally, when the CBCL Externalizing scale was included in the model, higher CY-BOCS ($\beta = -0.51$, $SE = 0.18$, $p = 0.005$) and CBCL-Externalizing ($\beta = -0.94$, $SE = 0.14$, $p < 0.001$) total scores were independently related to poorer QoL. In addition, CBCL-Externalizing scores were associated with linear ($\beta = 0.49$, $SE = 0.13$, $p < 0.001$) and quadratic ($\beta = -0.13$, $SE = 0.04$, $p < 0.001$) changes in QoL, but the CY-BOCS total score was unrelated to changes in QoL at post-treatment.

When examining parent QoL by specific subscales, emotional QoL was inversely related to baseline total scores on the CY-BOCS ($\beta = -0.76$, $SE = 0.29$, $p = 0.01$), CGI-S ($\beta = -6.79$, $SE = 2.01$, $p < 0.001$), CDRS ($\beta = -0.96$, $SE = 0.14$, $p < 0.001$), COIS-C ($\beta = -0.54$, $SE = 0.11$, $p < 0.001$), COIS-P ($\beta = -0.85$, $SE = 0.09$, $p < 0.001$), CBCL Internalizing scale ($\beta = -1.60$, $SE = 0.16$, $p < 0.001$), and CBCL Externalizing scale ($\beta = -1.22$, $SE = 0.22$, $p < 0.001$). Linear (CBCL Internalizing scale: $\beta = 0.35$, $SE = 0.17$, $p = 0.036$; CBCL Externalizing scale: $\beta = 0.76$, $SE = 0.21$, $p < 0.001$) and quadratic changes (CBCL Externalizing scale: $\beta = -0.23$, $SE = 0.07$, $p < 0.001$) in emotional QoL were also related to CBCL subscales. Physical QoL at baseline was inversely related to baseline total scores on the CY-BOCS ($\beta = -0.52$, $SE = 0.23$, $p = 0.024$), CGI-S ($\beta = -3.57$, $SE = 1.61$, $p < 0.001$), CDRS ($\beta = -0.54$, $SE = 0.12$, $p < 0.001$), COIS-C ($\beta = -0.43$, $SE = 0.13$, $p = 0.002$), CBCL Internalizing scale ($\beta = -0.99$, $SE = 0.14$, $p < 0.001$), and CBCL Externalizing scale ($\beta = -0.92$, $SE = 0.18$, $p < 0.001$). For the predictor COIS-P, higher total scores at baseline were associated with poorer QoL ($\beta = -0.71$, $SE = 0.12$, $p < 0.001$), as well as linear ($\beta = -0.37$, $SE = 0.12$, $p = 0.004$) and quadratic ($\beta = 0.11$, $SE = 0.04$, $p = 0.004$) changes over treatment. Finally, social QoL was inversely related to baseline total scores on the CY-BOCS ($\beta = -0.66$, $SE = 0.26$, $p = 0.012$), CGI-S ($\beta = -4.34$, $SE = 1.83$, $p = 0.019$), CDRS ($\beta = -0.38$, $SE = 0.14$, $p = 0.009$), COIS-C ($\beta = -0.36$, $SE = 0.15$, $p = 0.021$), COIS-P ($\beta = -0.77$, $SE = 0.14$, $p < 0.001$), and CBCL In-

ternalizing scale ($\beta = -0.84$, $SE = 0.18$, $p < 0.001$). For the predictor CBCL Externalizing scale, total scores at baseline were inversely associated with QoL ($\beta = -1.04$, $SE = 0.21$, $p < 0.001$), as well as linear ($\beta = 0.37$, $SE = 0.18$, $p = 0.036$) and quadratic ($\beta = -0.12$, $SE = 0.06$, $p = 0.032$) changes over treatment.

Discussion

This study examined QoL in a large, well-characterized sample of children with OCD who were rigorously treated with CBT. Consistent with others (Koran et al. 1996; Eisen et al. 2006; Lack et al. 2009) and in support of our hypothesis, this study found that parent-proxy ratings of child QoL were inversely related to obsessive-compulsive symptom severity, OCD-related functional impairment, and internalizing, externalizing, and depression symptoms at baseline. Further, consistent with others, child and parent-proxy ratings of child QoL were relatively low, particularly in emotional and school domains (Lack et al. 2009; De Caluwé and De Clercq 2015). Although expected, these findings reaffirm the impact of pediatric OCD and co-occurring symptoms on QoL, highlighting the need for effective intervention that improves symptomology, functionality, and life satisfaction.

Partially consistent with others (Weidle et al. 2015; Wellen et al. 2017), we found that QoL improved over CBT according to parents' perspective but not youth. Studies among adults with OCD have established that QoL improves after treatment (Moritz et al. 2005; Diefenbach et al. 2007; Norberg et al. 2008); the present results add to an increasing literature in children with OCD by demonstrating improved QoL after CBT. Despite improvement with treatment, QoL remained fairly low in emotional domains relative to norms for healthy children, suggesting that treatment duration may need to be extended beyond 10 sessions to witness improved emotional QoL. It may be that emotional QoL takes further time to improve and stabilize relative to obsessive-compulsive symptomology; support for this is found in the relationship between obsessive-compulsive symptom reduction and depression in that reductions in OCD preceded improved depressive symptoms over the course of CBT (Meyer et al. 2014). Indeed, in the absence of greater life satisfaction, children may be at heightened risk for symptom relapse and/or other psychopathology. Although the child-reported PedsQL has demonstrated treatment sensitivity in related conditions (McGuire et al. 2015) and non-significant improvements in this study, limited change was observed. Child-reported QoL may have been influenced by the method of measurement or difficulties that children with OCD have

reporting symptoms (e.g., poor symptom insight). On average, self-reports by children with OCD tend to be lower relative to clinicians and their parents (Storch et al. 2006; Conelea et al. 2012), which reflect difficulty in reporting on internal symptoms. Given this, assessments of both child and parent reports of QoL are highlighted. It is also possible that children did not experience notable changes during the 2-month intervention. Indeed, the other CBT protocols that have found improvements in child-reported QoL have lasted beyond 8 weeks. Thus, extended treatment durations may be necessary to achieve benefits in both OCD symptom reduction and QoL. Finally, we speculate that some children did not perceive significant changes in QoL as parents had reduced accommodating behaviors throughout treatment, thereby placing an increased burden of illness on the child.

Baseline clinical variables did not predict changes in QoL after treatment. This suggests that QoL is relatively responsive to effective intervention regardless of other clinical characteristics with which a child may present. Studies examining predictors of treatment outcome in pediatric OCD have found OCD severity (Garcia et al. 2010; Torp et al. 2015), OCD-related impairment (Garcia et al. 2010; Torp et al. 2015), comorbid externalizing and depressive disorders (Storch et al. 2008; Garcia et al. 2010; Torp et al. 2015), and family accommodation (Garcia et al. 2010) as related to attenuated outcome (for a review, see Ginsburg et al. 2008; Torp et al. 2015). It may be that QoL changes are not as pronounced or variable as changes in OCD symptom severity (typically measured by change in the CY-BOCS), accounting for the lack of association in the present sample. However, it is unclear as to whether baseline assays not included in this article (e.g., illness duration) may be related to QoL change.

Finally, cooccurring symptomology and impairment predicted parent-rated QoL accounting for obsessive-compulsive symptom severity. This is consistent with others (Lack et al. 2009; De Caluwé and De Clercq 2015) and suggests that OCD impairment and additional psychiatric burden impact QoL. Interventions, therefore, must account for each of these domains to most fully optimize the chance of a positive therapeutic outcome. Among the variables studied, externalizing symptoms, in particular, seem to impact QoL and were negatively associated with improvements in QoL during treatment. Those children with OCD and cooccurring externalizing symptoms may present as more clinically complex and impaired relative to those with OCD without significant externalizing symptoms (Storch et al. 2010a, 2010b). Externalizing symptoms may also adversely impact QoL domains such as social and emotional functioning beyond OCD alone. In light of findings that comorbid externalizing disorders impact CBT (Storch et al. 2008) and pharmacotherapy outcome (Geller et al. 2003) as well as QoL improvements, treatment approaches should be examined that either sequentially or concurrently address these problem behaviors (Sukhodolsky et al. 2013).

Several study limitations should be considered. First, this was a treatment seeking a fairly homogeneous sample of children with OCD. Therefore, results may not generalize to affected individuals not seeking care. Second, the study treatment course, though demonstrating robust efficacy, was relatively truncated compared with standard care, which may last between 12 (Piacentini et al. 2011) and 24 sessions (Skarphedinsson et al. 2015). It is possible that treatment effects that were obtained over a longer treatment course would lead to QoL improvements that could be consolidated. Third, certain inclusion criteria may have limited our ability to fully assess QoL in children with OCD. For example, children who needed a higher level of care were excluded and it is conceivable that their QoL may be worse relative to youth who could

be managed in outpatient care. Finally, the QoL measure that we used includes questions that may be less pertinent for children with OCD, such as impairment in physical health. A disease-specific QoL assay may be more applicable (Wellen et al. 2017). Although psychometrically sound measures of QoL exist, we highlight this as a need for future research.

Conclusions

Overall, QoL is related to obsessive-compulsive symptom severity, impairment, and internalizing and externalizing symptoms. Following a relatively short course of family-oriented CBT, QoL improved meaningfully. Finally, baseline variables measured were not associated with changes in QoL following treatment.

Clinical Significance

We contribute to the literature by reinforcing that QoL is negatively affected in children with OCD and inversely related with key clinical variables, namely symptom severity, impairment, and internalizing and externalizing symptoms. Interventions for childhood OCD should be broad-based and able to deal not only with the OCD symptoms but also the co-occurring impairment and symptomology which we found to be negatively related to QoL. This study also provides evidence that a relatively short, family-based behavioral intervention can positively affect QoL although more extensive intervention over a longer course may be needed to normalize QoL.

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