Child Psychiatry Hum Dev (2018) 49:308–316
DOI 10.1007/s10578-017-0748-6

ORIGINAL ARTICLE

Children's and Parents' Ability to Tolerate Child Distress: Impact on Cognitive Behavioral Therapy for Pediatric Obsessive Compulsive Disorder

Robert R. Selles[1,2] · Martin Franklin[3] · Jeffrey Sapyta[4] · Scott N. Compton[4] · Doug Tommet[5] · Richard N. Jones[5] · Abbe Garcia[5] · Jennifer Freeman[5]

Published online: 29 July 2017

Abstract The present study explored the concept of tolerance for child distress in 46 children (ages 5–8), along with their mothers and fathers, who received family-based CBT for OCD. The study sought to describe baseline tolerance, changes in tolerance with treatment, and the predictive impact of tolerance on symptom improvement. Tolerance was rated by clinicians on a single item and the CY-BOCS was used to measure OCD severity. Descriptive results suggested that all participants had some difficulty tolerating the child's distress at baseline while paired *t* tests indicated large improvements were made over treatment ($d = 1.2$–2.0). Fathers' initial tolerance was significantly related to symptom improvement in a multivariate regression as were fathers' and children's changes in distress tolerance over the course of treatment. Overall, results provide support for examining tolerance of child distress including its predictive impact and potential as a supplemental intervention target.

Keywords Distress tolerance · Treatment factors · Symptom improvement · Family · Parent · Exposure and response prevention

Pediatric OCD and Its Treatment

Obsessive compulsive disorder (OCD) is a debilitating condition that disrupts the normal course of childhood and results in significant functional impairment across domains [1–3], particularly for youth with an early onset of symptoms (e.g., before 8-years old) [4]. Clinical research has established cognitive behavioral therapy (CBT) as the first line treatment for pediatric OCD [5–7], with a particular emphasis placed on parental/family involvement for the youngest youth with OCD [8]. In CBT, sources of distress (e.g., thoughts, situations, stimuli) and their associated responses (i.e. avoidance, compulsions) are used to build a hierarchy of exposures through which children are guided to gradually face their fears while resisting their compulsions. Simultaneously, parents learn how to guide their child through exposures (so that they can be completed outside of session), work to reduce accommodations (i.e., parental strategies that temporarily reduce symptom distress or impairment), and increase appropriate limit setting. While well established as an efficacious treatment, concern remains over a sizeable portion of youth who demonstrate little, or below optimal, symptom improvement [9]. As a result, there is a growing interest in identifying factors that may predict or moderate the level of symptom improvement youth demonstrate during treatment. Patient insight, continued family accommodation, and negative family dynamics (e.g., conflict, blame, poor cohesion) have been identified as factors that predict reduced symptom improvement in CBT [10, 11]; however, child and parental distress tolerance also warrant investigation.

✉ Robert R. Selles
rselles@bcchr.ca

[1] University of British Columbia, Vancouver, Canada

[2] BC Children's Hospital Research Institute, Vancouver, Canada

[3] University of Pennsylvania, Philadelphia, USA

[4] Duke University Medical Center, Durham, USA

[5] Alpert Medical School, Brown University, Providence, USA

Child Tolerance of Distress

An individual's inability to tolerate distress is believed to be a core contributor to a number of psychological problems [12] including OCD [13]. When unable to tolerate distress, individuals seek out strategies that help them escape unpleasant thoughts, feelings, or experiences, such as avoidance and compulsions. These strategies reinforce themselves over time and reinforce the individual's belief that they cannot tolerate the distress. As a result, poor tolerance of distress in young children may set the foundation for the further development of symptoms and presents a clear opportunity for early intervention. Given that exposure and response prevention specifically requires individuals to experience distress without avoidance or escape, distress tolerance is likely an important skill that could both impact treatment initially and develop over the course of treatment. For example, youth with better distress tolerance may exhibit increased ability/willingness to engage in exposure tasks at treatment onset, as well as a greater ability to resist compulsive urges whenever obsessions arise. Improvements in distress tolerance may also allow children to tackle increasingly difficult exposures over treatment, increasing the likelihood of meaningful and lasting symptom improvement.

Parental Tolerance of Child Distress

The family system is an important contributing factor in the development, maintenance, and treatment of pediatric anxiety and OCD. Parents of anxious youth tend to be more reactive to signs of distress in their children than parents of non-anxious youth [14] and parental over-protectiveness and rejection appear to contribute to the development of anxiety in youth [15]. Symptoms of OCD have been shown to cause considerable impairments in the family's functioning [16] and, as mentioned above, family accommodation and negative family dynamics can contribute to greater OCD severity and reduced treatment outcome [17–22]. Therefore, it seems likely that parent tolerance of child distress (PTCD) may also play an important role in the functioning and treatment of youth with OCD.

Most parents likely feel burdened with the general experience of having a child with OCD (e.g., "it is upsetting to know my child is suffering"); however, parents' ability to tolerate specific acute displays of distress in their child (i.e. "I can't stand seeing my child upset") appears, in our clinical experience, a more variable and relevant construct. Parents may struggle with youth's distress for a number of additional reasons. For example, PTCD may be influenced by the parent–child attachment relationship [23] and a drive to protect or rescue the child from perceived danger. Parental symptoms of anxiety and/or OCD may further escalate the parent's perception of threat (e.g., "germs really might make the child sick") and a parent's tolerance of their own distress may be utilized in their ability to tolerate seeing their child's. Cognitive interpretations, such as catastrophizing the child's distress (e.g. "my child's distress will traumatize them") or parental self-blame (e.g., "it is my fault that my child is distressed") may further reduce PTCD. Along the same lines, misunderstanding why the distress is occurring (e.g., "my child hates me", "my child is crazy"), may lead parents to feel more powerless or hopeless in the face of the distress and unsure of how to best respond. The family's current dynamics, such as conflict, blame or poor cohesion [20], may also alter the parent's willingness to tolerate the child's distress. Finally, greater external manifestations of distress by the child, such as crying and disruptive behaviors/rage common to pediatric OCD [24–26], could make tolerating distress more difficult for parents.

Considering these factors, it seems likely that over time poor parental tolerance of child distress may be reinforced, similar to that of the child's, through the parent's use of avoidant or escape behaviors. For example, accommodation may be a primary coping strategy for parents with poor tolerance of child distress as their accommodations prevent or quickly alleviate their child's, and thereby their own, distress. Parents with low tolerance of child distress may also be more likely to give in when children exhibit distress as well as have difficulty setting limits, which might then reinforce the child's use of avoidant and distress-related behaviors (e.g., crying, tantrums). Parents who have difficulty tolerating their children's displays of distress may also have difficulty modeling calm responses to difficult situations for their child. As a result, children's belief that the stimuli or task is unsafe/bad may be reinforced by their parents' display of distress. As an extension of this, we would expect that parents with poor tolerance of child distress would fail to effectively engage in a range of important treatment behaviors, such as eliminating accommodations, setting appropriate limits, and encouraging approach, as these tasks would require the parent to directly place their child in distress. Therefore these youth may exhibit less improvement then youth of parents with greater tolerance.

Present Study

It has been discussed that the mechanism through which exposure and response prevention is effective may be in part due to individuals' increasing ability to tolerate distress and reduce their engagement in experiential avoidance [27]. In addition, parents play a clear role in the context of OCD symptom development, impairment,

and treatment, and therefore their tolerance of the child's distress should also be considered. While particularly emphasized within acceptance and commitment therapy approaches, we are unaware of work to date that has directly evaluated initial ratings and changes in distress tolerance throughout treatment or the impact these changes have on the rate and level of symptom improvement in pediatric OCD. Therefore the present study is a pilot examination of these factors within the Pediatric Obsessive Compulsive Disorder Treatment Study for Young Children (POTS Jr.) treatment study. Specifically, our goals were:

Aim 1 To examine youth and their parents' distress tolerance levels at baseline and following treatment. We hypothesized that individuals would have on average 'some' ($M=1$) distress tolerance at baseline, but that distress tolerance would significantly improve over the course of treatment.

Aim 2 To examine the predictive effect of baseline distress tolerance levels on the extent of symptom improvement. Here, we hypothesized that lower baseline abilities, in mothers, fathers, and children, to tolerate child distress would be associated with reduced symptom improvement over the course of treatment.

Aim 3 To examine whether change in distress tolerance during treatment was associated with the extent of symptom improvement. We hypothesized that mothers, fathers, and children who demonstrated greater improvements in tolerating child distress would also demonstrate greater symptom improvement over the course of treatment.

Methods

Study Design

The present study used data obtained as part of the POTS Jr trial, which was a 14-week, parallel-group, randomized controlled trial examining the efficacy of family-based CBT for young children (ages 5–8 years) in comparison to family-based relaxation therapy. The study rationale, design, methods, treatment description, and primary outcomes have been reported elsewhere [8]. POTS Jr participants were recruited from three sites (University of Pennsylvania, Duke University, and Brown University) and randomized to one of the two treatment arms. In particular, the present study focuses on the 63 youth randomized to the CBT arm. Institutional review board approval was obtained at each site. The Consolidated Standards of Reporting Trials diagram was originally reported in Freeman, Sapyta, et al. [8].

Participants

The initial participant pool for the present study was all 63 participants randomized to the CBT arm of the POTS Jr study [8]; however, in order to be included in the present analyses, participants were required to have an initial distress tolerance score recorded within the first 4 weeks of treatment and a last available observation in the final 5 weeks. Individuals who did not have data within these time points were excluded from analyses, leaving a sample of 46 families with the required data. Two of these participants dropped out of the study prior to post-treatment, so their Week 9 CY-BOCS score was carried forward to post-treatment. Excluded youth ($n=17$) did not significantly differ from included youth in regards to age [t (61) $=-0.15$, $p=.88$], baseline CY-BOCS score [t (61) $=-0.14$, $p=.89$], or change in CY-BOCS score from baseline to post-treatment [t (61) $=-0.06$, $p=.95$]. Included youth were between the ages of 5–8 ($M=6.9$, $SD=1.1$) and 57% ($n=26$) were female. Regarding study site, 26% ($n=12$) completed treatment at Brown University, 37% ($n=17$) at Duke University, and 37% ($n=17$) at University of Pennsylvania. While no specifically coded attendance data was available, completion of weekly distress tolerance ratings suggested attendance by families was excellent, with distress tolerance ratings present for children in 99% of sessions, for mothers' in 97% of sessions, and for fathers' in 89% of sessions.

Measures

Measure of Distress Tolerance

Comprised of a single item rated on a 0 (no ability to tolerate)—4 (excellent ability to tolerate) scale that included descriptive item anchors, clinicians rated distress tolerance for mothers, fathers, and children on a weekly basis. The measure was developed for the treatment study and its psychometric properties have not been examined. Information used by clinicians in order to make ratings of tolerance of child distress included observable displays of distress/discomfort, reported abilities to cope, demonstrations of escape, avoidant, or rescuing behaviors, and willingness/openness to face distress. For additional clarification, a parent who was rated as demonstrating "some" (1) tolerance of their child's distress may have been wary of their child facing a fear, displayed and reported high discomfort in seeing their child upset, and quickly attempted to engage in rescuing behaviors when distress rose above a minimal level (e.g., providing reassurance, helping the child access compulsion). Conversely, a parent who was rated as demonstrating "very good" (3) tolerance of their child's distress may appear collected and largely calm when seeing their child distress, and are encouraging their child's engagement

with distress and generally not using accommodations to alleviate the child's distress, although they may still be somewhat apprehensive about next big steps or pushing the child too hard.

Children's Yale-Brown Obsessive Compulsive Scale (CY-BOCS) [28]

The CY-BOCS is a measure of OCD symptom severity in youth and is comprised of 10 items that inquire about time spent, interference, distress, resistance, and control for both obsessions and compulsions. Items are rated on a 0 (no symptoms) to 4 (extreme symptoms) scale. Independent raters completed the CY-BOCS at baseline, week 5, week 9, and post-treatment, while parents also completed a parent report version (CY-BOCS-PR) weekly. Psychometric properties of the clinician-rated CY-BOCS are well-established [28, 29], and psychometric properties of the parent-rated version support its use [30].

Family Accommodation Scale – Self Report (FAS-SR) [31]

The FAS-SR is a 19-item measure of family accommodation rated by the relative providing accommodations, which in the present study, was parents of youth. When examined in adults, the FAS-SR has been shown to have excellent internal consistency, good convergent validity, and strong agreement with the clinician-rated interview format of the Family Accommodation Scale [31].

Analytic Plan

Data analysis was conducted using R 3.3.1 and Mplus 7.4. Examination of the first goal used descriptive analysis and paired-samples *t* tests. For goals two and three, data were examined using multivariate regression models that controlled for child age, gender, site, and assessment week. Differences in distress tolerance scores were calculated between the first available observation within the first 4 weeks of treatment and the last available observation within the final 5 study weeks of treatment. The outcome variable was the change in symptom score. For the second goal the difference in CY-BOCS scores from baseline to post-treatment and the difference in CY-BOCS-PR scores from baseline to post-treatment were regressed on baseline distress tolerance. For the third goal, the difference between the first and last observed distress tolerance scores was added as a covariate to the model.

Results

Levels and Change in Distress Tolerance

Table 1 outlines ratings of, and size of change in, tolerance of child distress for mothers, fathers, and children at baseline and post-treatment. Descriptive data at baseline suggest that, on the whole, participants were rated as having some difficulty in tolerating distress. In particular, children were rated as the least competent in tolerating their distress ($M=0.7$; $SD=0.7$), which is unsurprising given their young age and that they are most directly experiencing the distress. Regarding parents, mothers were rated as slightly less tolerant of distress ($M=1.2$; $SD=0.8$) in comparison to fathers ($M=1.6$; $SD=0.8$). Mothers' baseline scores were correlated with fathers' baseline scores ($r=0.55$), as were mothers' and fathers' baseline scores with children's baseline ratings ($r=0.49$, 0.56). Baseline ratings of family accommodation were not highly correlated with baseline distress tolerance ratings for mothers ($r=-0.17$), fathers ($r=-0.18$), or children ($r=-0.18$), suggesting independent constructs.

Paired samples *t* tests indicated that all groups demonstrated significant improvements in distress tolerance over the course of treatment, with robust effect sizes for mothers ($d=-1.8$, $p<.001$), fathers ($d=-1.2$, $p<.001$), and children ($d=-2.0$, $p<.001$). By post-treatment, distress tolerance ratings were in the very good range on average for both mothers ($M=3.0$; $SD=0.8$) and fathers ($M=2.9$; $SD=0.9$), while children demonstrated ratings in the good-very good range ($M=2.6$; $SD=0.7$). Within families, strong associations in levels of change were observed for

Table 1 Change in distress tolerance ratings over treatment

Rater	Time point	*n* (%)					*M (SD)*	Change
		None	Some	Good	Very good	Excellent		
Mother ($n=46$)	First	7 (15)	25 (54)	12 (26)	2 (4)	0 (0)	1.2 (0.8)	$d=-1.8$**
	Last	0 (0)	1 (2)	12 (26)	21 (46)	12 (26)	2.3 (0.8)	$t=-11.44$
Father ($n=46$)	First	5 (11)	15 (33)	18 (39)	8 (17)	0 (0)	1.6 (0.8)	$d=-1.2$**
	Last	0 (0)	6 (13)	10 (22)	13 (28)	17 (37)	2.9 (0.9)	$t=-6.30$
Child ($n=46$)	First	22 (48)	19 (41)	4 (9)	1 (2)	0 (0)	0.7 (0.7)	$d=-2.0$**
	Last	0 (0)	6 (13)	15 (33)	17 (37)	8 (17)	2.6 (0.7)	t = −12.28

**$p<.001$

mothers and fathers ($r=0.75$), while moderate associations were observed for mothers and child ($r=0.51$), and fathers and child ($r=0.46$).

Predictive Effect of Baseline Distress Tolerance

Table 2 provides a summary of the results from the regression model examining the predictive value of baseline distress tolerance on levels of symptom improvement. Significant results were observed for fathers' baseline tolerance in regards to symptom improvement on the clinician-rated CY-BOCS (regression coefficient, $b=3.3$; standardized regression coefficient, $B=0.22$, $p=.01$) and almost reached significance on the CY-BOCS-PR ($b=3.5$; $B=0.32$, $p=.051$). This indicates that for each level of higher ability to tolerate distress a father demonstrated at baseline (e.g., none compared to some; some compared to good), their child's post-treatment score decreased by 3.3 points on the CY-BOCS and by 3.5 points on the CY-BOCS-PR. Baseline distress tolerance was not a significant predictor of post-treatment symptom improvement for mothers or children.

Predictive Effect of Change in Distress Tolerance

Table 2 provides a summary of the results from the regression model examining the predictive value of the change in distress tolerance on levels of symptom improvement. Children's change in distress tolerance scores were associated with the largest impact on symptom improvement on the CY-BOCS ($b=3.6$; $B=0.51$, $p<.001$) and the change almost reached significance on the CY-BOCS-PR ($b=3.5$; $B=0.36$, $p=.053$). This indicates that for each level a child improved in their ability to tolerate distress over the course of treatment (e.g., none improved to some; some improved to good), their post-treatment CY-BOCS demonstrated a 3.6 point decrease and their CY-BOCS-PR a 3.5 point decrease. Father's abilities to improve their distress tolerance was also significantly related to symptom improvement on the CY-BOCS ($b=2.4$; $B=0.40$, $p=.04$) but not on the CY-BOCS-PR despite a larger associated decrease ($b=2.7$; $B=0.34$, $p=.13$). For mothers, change in distress tolerance was not significantly associated with symptom improvement.

Discussion

Overall, our results found that on average children, mothers, and fathers, tend to be perceived by clinicians as having at least some difficulty in tolerating the child's distress prior to treatment. Distress tolerance ratings were correlated among family members but were not significantly correlated to ratings of family accommodation, suggesting that distress tolerance may be an independent construct related to OCD within the family system. Poor distress tolerance in both youth and parents may develop as a result of the symptoms associated with OCD (e.g., frequent experienced distress, compulsive behaviors prevent development of tolerance), but may also be a factor that contributes to symptom development by driving the use of problematic and reinforcing anxiolytic strategies by youth and families, such as avoidance/escape, compulsions, accommodation, and permissive parenting. Future research comparing baseline distress tolerance levels of clinical and sub-clinical families could shed light on its contribution to severity and impairment while inclusion of various clinical correlates, such as parent anxiety/OCD, anxiety sensitivity, attachment, coercive/disruptive behaviors and family dynamic variables, could enhance understanding of underlying contributors to variations in reported distress tolerance.

The present study also observed that treatment was associated with large improvements in distress tolerance for all participants. This robust change suggests that distress tolerance can be developed over treatment, likely driven by increased understanding of the cause, and rationale for experiencing, distress, as well as repeated practice engaging in, and remaining with, distress (i.e. exposure and

Table 2 Impact of distress tolerance on CY-BOCS scores at post-treatment

Distress tolerance	Clinician			Parent		
	b (*B*)	*p*	R^2	*b* (*B*)	*p*	R^2
Baseline distress tolerance						
Mother (N=46, 44)	2.2 (0.22)	.13	.18	1.9 (0.14)	.38	.03
Father (N=46, 44)	3.3 (0.39)	.01	.28	3.5 (0.32)	.051	.11
Child (N=46, 44)	1.2 (0.12)	.44	.14	1.5 (0.11)	.52	.02
Change in distress tolerance						
Mother (N=46, 44)	1.7 (0.23)	.26	.18	2.0 (0.20)	.36	.23
Father (N=46, 44)	2.4 (0.40)	.04	.35	2.7 (0.34)	.13	.32
Child (N=46, 44)	3.6 (0.51)	<.001	.31	3.5 (0.36)	.053	.28

b regression coefficient, *B* standardized regression coefficient, R^2 adjusted R^2

response prevention). The reduction of symptom intensity over time may also contribute to youth and parents abilities to tolerate distress. While these outcomes were not measured, one could hypothesize that reductions in family stress, impairment, and conflict as well as improved parent–child relationships, could also potentially contribute to increased PTCD.

The role of distress tolerance within exposure therapy is further supported by its relationship with symptom improvement for youth. Regarding baseline distress tolerance, the results suggested that, in particular, fathers' ability to tolerate distress was related to symptom improvement, while the impact of mothers' baseline distress tolerance failed to reach statistical significance ($p = .38$) and the child's baseline distress tolerance did not appear to be strongly related to symptom improvement ($p = .52$). At the onset of treatment, parents may play a particularly important role in encouraging youth to participate in treatment and can initiate symptom improvement. This is particularly likely in the present study where child age necessitated heavy parental involvement in treatment. As a result, a father's ability to tolerate their child's displays of distress at the beginning of treatment would allow them to initiate treatment components (e.g., reductions in accommodation; motivating the child for exposures), even if the child struggled to tolerate their own distress, thereby leading to greater symptom improvement.

Regarding the impact of improvements in distress tolerance, results of the present study suggested that change in children's distress tolerance was important in predicting symptom improvement. This relationship may reflect that children who do not improve in their ability to tolerate distress are less resistant to compulsive behaviors and as a result may sabotage exposure tasks and generally continue to reinforce their symptoms. Further, they may be more resistant to engaging in exposure tasks and may demonstrate slower progress along their hierarchy. However, failure to develop distress tolerance over treatment, and thereby improve, may also be a result of inadequate engagement of the treatment mechanism (e.g., exposures did not elicit distress or adequately target core fears). Change in fathers' distress tolerance over treatment was also a significant predictor of symptom improvement on the CY-BOCS while change in mothers' ability to tolerate child distress was not.

The difference observed in predictive level between mothers and fathers on both baseline distress tolerance and change in distress tolerance was unexpected. However, review of prior research indicates the importance of fathers in the development and treatment of anxiety symptoms, particularly that fathers who are not warm, encouraging of autonomy, or involved, tend to have more anxious children [32]. One explanation may be that mothers act more consistently regardless of their distress tolerance as compared to fathers. For example, mothers may make attempts to complete the treatment (e.g., reduce accommodation, monitor exposure completion) regardless of whether they have difficulty tolerating their child's distress. In comparison, fathers who have difficulty tolerating distress and do not overcome this during treatment, may be more rejecting of the child and their behavior/symptoms/treatment. This may contribute to ongoing negative family dynamics, while fathers who improve their distress tolerance may become more willing to be actively involved and encouraging of the child facing fears. In addition, fathers' displays of anxiety, rather than mothers, has been identified as relating to anxiety in the child [33, 34]. If youth have greater expectations that their fathers, rather than their mothers, be calm, unemotional, or encouraging of approach to anxiety-provoking stimuli, displays of distress in the father may more strongly reinforce the child's own experience of anxiety. In the present context, if a father continues to struggle with tolerating their child's displays of distress and, as a result, frequently appear anxious when interacting with the child, this may contribute to less treatment success.

The results of the regression analyses only reached clinical significance on 5 of the 12 variables; however, this appears to be a function of the small sample size as the effect sizes and clinical relevance appear large. As per parameters suggested by signal detection analyses for the CY-BOCS [35], treatment response occurs at a 35% symptom reduction (i.e. 9-points on average) and remission occurs at a 55% symptom reduction (i.e., 14-points on average). Therefore, the 2–3 point per distress tolerance level change observed for variables in the present study suggest that distress tolerance abilities are highly associated with the observed level of response for youths.

Despite this, with little direct examination of distress tolerance to date, it is difficult to determine whether distress tolerance is a mechanism through which exposure produces symptom improvement or a skill that allows individuals to better engage in exposure and therefore benefit from treatment via different mechanisms (e.g., habituation; inhibitory learning). Likely, it serves to some extent in both roles and further direct examinations of varying hypothesized mechanisms of treatment are needed to more clearly define the unique role of distress tolerance. It is also possible that distress tolerance interacts with the other hypothesized mechanisms of exposure therapy such as habituation [36] and inhibitory learning [37]. For example, a child who does not tolerate their distress and continues to engage in their compulsions after exposures will not have the opportunity to experience habituation and/or learn that their feared outcome did not occur without the use of compulsions. Finally, it seems possible that the impact of PTCD on outcome is tied in part to its impact or relationship to changes in other family factors known to impact treatment outcome,

such as family dynamics and family accommodation [10, 19, 20, 22].

Further research is needed to determine specifically whether and/or how treatment should target distress tolerance in youth and their parents. In general, the results suggest that the treatment protocol employed in the present study had a large impact on distress tolerance levels; however, given that improvements in distress tolerance were associated with considerable improvements in outcome particularly for children, emphasizing this change, or targeting individuals who appear slower in improving their distress tolerance, could hypothetically improve outcomes. What the results may suggest is that the addition of specific intervention components focused on improving distress tolerance are not necessary for all individuals, but may hold value if used specifically with youth and parents whose distress tolerance fails to improve.

Along this line, it is of interest to consider how the results may differ in alternative samples. First, it is of interest whether PTCD would improve with treatment and relate to treatment outcome even if parental involvement in symptoms and/or treatment was limited (e.g., adolescents; individual treatment; primary intrusive thoughts and mental rituals). One may hypothesize that improvements would be smaller than those observed in the present study with the opporuntity for only small improvements made through observation of the child's engagement in exposures. In regards to impact on outcome, on the one hand, PTCD may have a smaller impact on treatment outcome as parents are less involved in treatment exercises. On the other hand, it may also have a greater impact on outcomes as parents with poor distress tolerance may not improve without involvement in the intervention and may, as a result, continue to use problematic accommodations and engage in problematic reactions to child distress. Regardless, further examination of distress tolerance in these alternative pediatric OCD treatment samples and studies (e.g., adolescent, individual) is needed to better understand its role.

It is also interesting to consider whether these results would be similar with treatment approaches that do not place the same emphasis on facing and remaining with distress. For example, CBT for pediatric anxiety disorders has often utilized a "tool" based approach that includes strategies intended to help youth directly reduce their experiences of distress (e.g., cognitive restructuring, relaxation) along with exposures. Parents and youth with poor tolerance of distress may favor these alternative strategies over exposure, which could limit their and their child's opportunities to improve distress tolerance and ultimately their treatment outcomes. Given that initiation of exposures has been associated with improvements in pediatric anxiety treatment [38] and CBT for pediatric anxiety has historically underperformed CBT for OCD [6, 39], future research in this area is warranted. Child distress tolerance and PTCD may also be constructs worthy of consideration in a wider range of psychiatric disorders such as depression and disruptive behavior, where they could also potentially contribute to maladaptive coping strategies and reinforcement of negative behavior patterns.

The findings of the present study should be considered within the context of its limitations. First, the study is limited by the measure used to examine tolerance of child distress. The measure has not been previously examined and specific psychometric data was not available to evaluate its reliability/validity in the present study. While this measure included descriptive anchors and was rated by clinicians familiar with the construct, no objective psychophysiological correlates were included and the observable data used to make ratings (e.g., visible distress; use of escape behaviors) may have been present for reasons other than poor tolerance of child's distress, such as the parent's general level of anxiety or continued accommodation in order to minimize disruption to siblings. In addition, it appears possible that clinicians' ratings of distress tolerance could be influenced by more general factors (e.g., overall severity of symptoms). As a result, it is not possible to assume that all the observed results can be directly attributed to distress tolerance. Future research should include additional measures of distress tolerance including self-report, physiological, as well as behavioral tasks, that may be more objectively rated and used to assess convergent validity. Second, while the present study benefits from the rigorous design of the initial randomized controlled trial and the inclusion of youth from three study sites, the limited age range and small number of participants limit the study's generalizability and power. Finally, it is important to note that, while they are likely related, parent's "distress tolerance" in the present study refers specifically to their ability to tolerate displays of distress in their child and not in regards to other areas of distress.

Summary

Emerging research has identified various factors that relate to symptom improvement levels demonstrated during CBT for youth with OCD. Theory suggests that children who have difficulty tolerating distress, as well as parents who cannot tolerate their child in distress, may be less effective in treatment. Therefore, the present study sought to examine this hypothesis empirically. Examining these outcomes in 46 children with OCD and their parents, the present study examined levels of distress tolerance at baseline, changes in distress tolerance associated with receiving CBT, and the relationship between distress tolerance and symptom improvement. Distress tolerance ratings were

made by the treating clinician on a 5-point scale ranging from "none" to "excellent." Symptom improvement was measured using both the clinician and parent rated versions of the CY-BOCS. Clinician ratings at baseline suggested that on average, abilities to tolerate the child's distress were minimal, with children showing the least distress tolerance, followed by mothers, followed by fathers. However, treatment was associated with large improvements in distress tolerance abilities for all participants. In addition, fathers' ability to tolerate distress at baseline was significantly related to the child's symptom improvement, with a 3.3 point decrease ($p = .01$) in CY-BOCS score at post-treatment associated with every one-point difference in distress tolerance between fathers at baseline. In addition, symptom improvement levels were predicted by fathers' and children's changes in distress tolerance over the course of treatment, corresponding to a 2.4 point ($p = .04$) and 3.6 point ($p < .001$) decrease in CY-BOCS score, respectively. Overall, results of the present study provide preliminary support that children's ability to tolerate their distress and parent's ability to tolerate the child's demonstrations of distress may be important variables in the processes of CBT for OCD. With continued interest in improving the outcomes of CBT in this population, particularly for traditionally treatment-resistant youth, distress tolerance appears to be a construct with potential for further exploration. Future research should focus on improving measurement of distress tolerance, examining its role across more varied treatment samples, assessing its contribution to the phenomenology of pediatric OCD, defining its contribution to treatment mechanisms, and exploring adjunct interventions that may enhance distress tolerance improvements and ultimately treatment outcomes.

Funding The funding was provided by National Institutte of Mental Health (Grant Nos. R01-MH079377, R01-MH079154, R01-MH79127).

Appendix: Measure of Child and Parent Distress Tolerance

Please rate your judgment of the PARENTS' ability to tolerate anxiety generated by their child's experience of OCD:

Mother	Father	
0	0	No ability to tolerate anxiety generated by their child's OCD (e.g., accommodates all behaviors of the child, takes control of situations to prevent the child from experiencing distress, and/or becomes extremely upset personally when seeing the child become distressed by OCD)
1	1	Limited ability to tolerate anxiety (e.g., does not accommodate OCD in a few situations, allows the child to experience OCD distress in a few instances, and/or is very upset when seeing the child distressed by OCD)
2	2	Good ability to tolerate anxiety (e.g., does not accommodate OCD about half of the time, allows the child to experience OCD distress about half of the time, and/or is moderately upset when seeing the child become distressed by OCD)
3	3	Very good ability to tolerate anxiety (e.g., does not accommodate OCD most of the time, allows the child to experience OCD distress most of the time, and/or is mildly upset when seeing the child become distressed by OCD)
4	4	Excellent ability to tolerate anxiety (e.g., little to no accommodation of OCD, generally allows the child to experience OCD distress, and/or is not upset personally when seeing the child become distressed by OCD)

Please rate your judgment of the CHILD's ability to tolerate anxiety generated by OCD

0 No ability to tolerate anxiety generated by their OCD (e.g., child is unable to function when experiencing OCD, has OCD-related "melt downs" daily, and/or can not be calmed even with parents' help)

1 Limited ability to tolerate anxiety (e.g., child has significant difficulty functioning when experiencing OCD, has OCD-related "melt downs" almost daily, and/or is extremely difficult to calm even with parents' help)

2 Good ability to tolerate anxiety (e.g., child has moderate difficulty functioning when experiencing OCD, has OCD-related "melt downs" on occasion, and/or can be calmed with parents' help)

3 Very good ability to tolerate anxiety (e.g., child functioning is only mildly
affected by OCD, child OCD-related incidents occur but do not impact the child or family very much, and/or the child can be calmed easily by the parents)

4 Excellent ability to tolerate anxiety (e.g., child functioning is not affected by OCD, child almost no OCD-related incidents, and/or child does not need parents help to calm when experiencing OCD)

References

1. Lack CW et al (2009) Quality of life in children and adolescents with obsessive-compulsive disorder: base rates, parent-child agreement, and clinical correlates. Soc Psychiatry Psychiatr Epidemiol 44(11):935–942
2. Piacentini J et al (2003) Functional impairment in children and adolescents with obsessive-compulsive disorder. J Child Adolesc Psychopharmacol 13(Suppl 1):S61–S69
3. Valderhaug R, Ivarsson T (2005) Functional impairment in clinical samples of Norwegian and Swedish children and adolescents with obsessive-compulsive disorder. Eur Child Adolesc Psychiatry 14(3):164–173

4. Nakatani E et al (2011) Children with very early onset obsessive-compulsive disorder: clinical features and treatment outcome. J Child Psychol Psychiatry 52(12):1261–1268
5. Freeman J et al (2014) Evidence base update for psychosocial treatments for pediatric obsessive-compulsive disorder. J Clin Child Adolesc Psychol 43(1):7–26
6. Watson HJ, Rees CS (2008) Meta-analysis of randomized, controlled treatment trials for pediatric obsessive-compulsive disorder. J Child Psychol Psychiatry 49(5):489–498
7. Geller D, March J, T.A.C.o.Q Issues (2012) Practice parameter for the assessment and treatment of children and adolescents with obsessive-compulsive disorder. J Am Acad Child Adolesc Psychiatry 51(1):98–113
8. Freeman J et al (2014) Family-based treatment of early childhood obsessive-compulsive disorder: the Pediatric Obsessive-Compulsive Disorder Treatment Study for Young Children (POTS Jr)–a randomized clinical trial. JAMA Psychiatry 71(6):689–698
9. Pallanti S, Quercioli L (2006) Treatment-refractory obsessive-compulsive disorder: methodological issues, operational definitions and therapeutic lines. Prog Neuropsychopharmacol Biol Psychiatry 30(3):400–412
10. Garcia AM et al (2010) Predictors and moderators of treatment outcome in the Pediatric Obsessive Compulsive Treatment Study (POTS I). J Am Acad Child Adolesc Psychiatry 49(10):1024-1033 (**quiz 1086**)
11. Peris TS, Piacentini J (2013) Optimizing treatment for complex cases of childhood obsessive compulsive disorder: a preliminary trial. J Clin Child Adolesc Psychol 42(1):1–8
12. Hayes SC et al (1996) Experimental avoidance and behavioral disorders: a functional dimensional approach to diagnosis and treatment. J Consult Clin Psychol 64(6):1152–1168
13. Abramowitz JS, Lackey GR, Wheaton MG (2009) Obsessive-compulsive symptoms: the contribution of obsessional beliefs and experiential avoidance. J Anxiety Disord 23(2):160–166
14. Hudson JL, Comer JS, Kendall PC (2008) Parental responses to positive and negative emotions in anxious and nonanxious children. J Clin Child Adolesc Psychol 37(2):303–313
15. Muris P et al (2000) Worry in children is related to perceived parental rearing and attachment. Behav Res Ther 38(5):487–497
16. Stewart SE et al (2016) A multi-site study of family functioning impairment in pediatric obsessive-compulsive disorder. J Am Acad Child Adolesc Psychiatry. doi:10.1016/j.jaac.2016.12.012
17. Wu MS et al (2014) Phenomenological considerations of family accommodation: related clinical characteristics and family factors in pediatric obsessive-compulsive disorder. J Obsessive Compuls Relat Disord 3:228–235
18. Bipeta R et al (2013) A cross-sectional study of insight and family accommodation in pediatric obsessive-compulsive disorder. Child Adolesc Psychiatry Ment Health 7(1):20
19. Merlo LJ et al (2009) Decreased family accommodation associated with improved therapy outcome in pediatric obsessive-compulsive disorder. J Consult Clin Psychol 77(2):355–360
20. Peris TS et al (2008) Correlates of accommodation of pediatric obsessive-compulsive disorder: parent, child, and family characteristics. J Am Acad Child Adolesc Psychiatry 47(10):1173–1181
21. Storch EA et al (2007) Family accommodation in pediatric obsessive-compulsive disorder. J Clin Child Adolesc Psychol 36(2):207–216
22. Peris TS et al (2012) Family factors predict treatment outcome for pediatric obsessive-compulsive disorder. J Consult Clin Psychol 80(2):255–263
23. Doron G, Kyrios M (2005) Obsessive compulsive disorder: a review of possible specific internal representations within a broader cognitive theory. Clin Psychol Rev 25(4):415–432
24. Lebowitz ER et al (2015) Clinical and family correlates of coercive–disruptive behavior in children and adolescents with obsessive–compulsive disorder. J Child Fam Stud 24(9):2589–2597
25. Lebowitz ER, Omer H, Leckman JF (2011) Coercive and disruptive behaviors in pediatric obsessive-compulsive disorder. Depress Anxiety 28(10):899–905
26. Storch EA et al (2012) Rage attacks in pediatric obsessive-compulsive disorder: phenomenology and clinical correlates. J Am Acad Child Adolesc Psychiatry 51(6):582–592
27. Twohig MP et al (2015) Exposure therapy for OCD from an acceptance and commitment therapy (ACT) framework. J Obsessive Compuls Relat Disord 6:167–173
28. Scahill L et al (1997) Children's Yale-Brown Obsessive Compulsive Scale: reliability and validity. J Am Acad Child Adolesc Psychiatry 36(6):844–852
29. Storch EA et al (2004) Psychometric evaluation of the Children's Yale-Brown Obsessive-Compulsive Scale. Psychiatry Res 129(1):91–98
30. Storch EA et al (2006) The Children's Yale-Brown obsessive-compulsive scale: psychometric properties of child- and parent-report formats. J Anxiety Disord 20(8):1055–1070
31. Pinto A, Van Noppen B, Calvocoressi L (2013) Development and preliminary psychometric evaluation of a self-rated version of the Family Accommodation Scale for Obsessive-Compulsive Disorder. J Obsessive Compuls Relat Disord 2(4):457–465
32. Bogels S, Phares V (2008) Fathers' role in the etiology, prevention and treatment of child anxiety: a review and new model. Clin Psychol Rev 28(4):539–558
33. Bosco GL et al (2003) The connections between adolescents' perceptions of parents, parental psychological symptoms, and adolescent functioning. J Appl Dev Psychol 24:179–200
34. Brakel AML et al (2006) A multifactorial model for the aetiology of anxiety in non-clinical adolescents: main and interactive effects of behavioural inhibition, attachment, and parental rearing. J Child Fam Stud 15:568–578
35. Skarphedinsson G et al (2016) Defining cognitive-behavior therapy response and remission in pediatric OCD: a signal detection analysis of the Children's Yale-Brown Obsessive Compulsive Scale. Eur Child Adolesc Psychiatry 26:47–55
36. Benito KG, Walther M (2015) Therapeutic process during exposure: habituation model. J Obsessive Compuls Relat Disord 6:147–157
37. Craske MG et al (2014) Maximizing exposure therapy: an inhibitory learning approach. Behav Res Ther 58:10–23
38. Peris TS et al (2015) Trajectories of change in youth anxiety during cognitive-behavior therapy. J Consult Clin Psychol 83(2):239–252
39. In-Albon T, Schneider S (2007) Psychotherapy of childhood anxiety disorders: a meta-analysis. J Psychother Psychosom 76(1):15–24