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EVIDENCE BASE UPDATE

Evidence Base Update of Psychosocial Treatments for Pediatric Obsessive-Compulsive Disorder: Evaluating, Improving, and Transporting What Works

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Pediatric obsessive-compulsive disorder is a chronic and impairing condition that often persists into adulthood. This review refreshes the state of support for psychosocial treatments and the predictors or moderators that relate to their efficacy and evaluates how the literature has improved since the last update in 2014. A secondary goal is to propose an additional framework for the categorization of studies based on central research questions rather than treatment format. Psychosocial treatment studies conducted since the last review are described and evaluated according to methodological rigor and evidence-based classification using the *Journal of Clinical Child and Adolescent Psychology* evidence-based treatment evaluation criteria. Findings again converge in support of cognitive-behavioral therapy (CBT) as an effective and appropriate first-line treatment for youth with obsessive-compulsive disorder. Family-focused CBT is now *well-established*. A number of other treatments including CBT + D-Cycloserine, CBT+ Sertraline, CBT+ positive family interaction therapy, and technology-based CBT are now *probably efficacious*. Demographic, clinical, and family factors are consistent predictors of CBT outcome with conflicting findings for neurocognitive predictors. The field has advanced significantly since the last review, but there is still room for improvement. Some of the conclusions that can be drawn may be limited by our evaluation criteria. Future directions are proposed to advance treatment outcome research beyond a focus on which treatments work to exploring factors that account for how and why they work.

Obsessive-compulsive disorder (OCD) is a chronic and impairing illness experienced by 2% to 3% of children and adolescents (Canals, Hernández-Martínez, Cosi, & Voltas, 2012; Fontenelle, Mendlowicz, & Versiani, 2006; Heyman et al., 2001; Zohar, 1999), and there is consistent evidence suggesting that patients with OCD exhibit impairment in several domains of functioning, including school, friendships, daily activities (including sleep), and family relationships (Piacentini, Lindsey, Keller, & McCracken, 2003; E. Storch et al., 2008; Valderhaug & Ivarsson, 2005). Symptoms often persist (Mancebo et al., 2014; Micali et al., 2010; Stewart et al., 2004) and are associated with a cascade of delayed developmental milestones and costly adult disability (including depression, substance abuse, and suicide attempts) if left untreated (Ezpeleta, Keeler, Erkanli, Jane, & Angold, 2001; Flament et al., 1990; Piacentini et al., 2003; Thomsen & Mikkelsen, 1995). OCD has been characterized as the 11th national cause of disability (following illnesses such as heart disease, diabetes, and cancer) leading to decreased work productivity and increased utilization of health care ("A Real Illness: Obsessive-Compulsive Disorder," 2017; "Facts about Obsessive Compulsive Disorder," 2017). As a result, it is important to regularly evaluate the state of psychosocial treatments for pediatric OCD and evaluate methods for improving their delivery.

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Past Evidence Base Updates for Pediatric OCD

In the first evidence base review of the pediatric OCD psychosocial treatment literature by Barrett and colleagues (Barrett, Farrell, Pina, Peris, & Piacentini, 2008), the authors identified 16 studies published between 1994 and 2007 and classified them according to established criteria at the time (Chambless et al., 1996, 1998; Chambless & Hollon, 1998). Of note, only four of these studies were randomized controlled trials (RCTs). Based on these criteria, individual exposure-based cognitive-behavioral therapy (CBT) was considered *probably efficacious*, whereas non-family-focused group CBT and family-focused individual CBT were considered *possibly efficacious*. Barrett et al. (2008) offered numerous recommendations to guide future research, including the importance of replicating studies; examining the relative efficacy of various modalities (e.g., group vs. individual vs. family); developing strategies to address treatment nonresponse; identifying the predictors, moderators, and mediators of treatment; and examining the dissemination and implementation of evidence-based treatments (EBTs) in community settings.

The literature was again reviewed by Freeman, Garcia, and colleagues (2014), using an updated set of criteria for evaluating the evidence base (Southam-Gerow & Prinstein, 2014). Despite the addition of many new studies (18 additional studies reviewed, nine RCTs), no single treatment for pediatric OCD was deemed *well-established* as specified by the Southam-Gerow and Prinstein (2014) criteria. Although there were more RCTs, many of these controlled trials tested novel variants of CBT or were lacking in other aspects of methodological rigor, which led to tentative conclusions when evaluating their evidence base. Individual CBT was shown to be probably efficacious, remaining in the same category (Barrett et al., 2008) due to difficulty comparing studies with slightly different treatments and outcome measures, as well as the need to replicate findings across different investigatory teams. Previously considered a possibly efficacious treatment (Barrett et al., 2008), family-focused individual CBT was deemed a probably efficacious treatment. Based on the 2014 review, both family-focused group CBT and non-family-focused group CBT were considered possibly efficacious treatments. A new treatment format, non-face-to-face (or technology-based) CBT, was also included in the 2014 review. Although traditional "face-to-face" CBT was a probably efficacious treatment, delivery of CBT using alternative, non face-to-face delivery modalities such as via telephone or webcam, was designated a possibly efficacious treatment.

The results of the last evidence base update clearly converged in support of CBT as an effective and appropriate first line treatment for youth with OCD. There were many high-quality studies demonstrating the efficacy of CBT across different settings, formats, age groups, and ranges of severity and comorbidity. A greater number of studies utilized active treatment comparison groups as compared to the original Barrett et al. (2008) update, including brief CBT (Bolton et al., 2011; Franklin et al., 2011), well-established medications (Franklin et al., 2011), and psychosocial treatments such as relaxation (Freeman et al., 2008; Piacentini et al., 2011). The ability to control for the nonspecific effects of treatment and/or to demonstrate the incremental benefit of a treatment in comparison to another form of CBT for pediatric OCD was an important step forward. However, more complex comparisons like these require a closer consideration of treatment differences that can be masked by small effect-size differences.

A number of significant methodological limitations identified in the 2014 update are a key focus of the current article. One such issue concerned limited inclusion of racially, ethnically, and economically diverse populations of youth, as well the absence of more severe and complicated clinical presentations, contributing to unclear generalizability of findings. Other methodological issues identified in the last review included choice of control group (e.g., waitlist, placebo, active control), diverging analytic strategies, and inconsistent outcome metrics even across the same measures. Variation in CBT ingredients (e.g., cognitive emphasis, exposure with response prevention [ERP]), format (e.g., group, individual), and augmentation approaches (e.g., serotonin reuptake inhibitor [SRI] medication or D-cycloserine [DCS]) were strengths of this growing literature, yet they made comparing studies to one another quite challenging (Freeman, Garcia, et al., 2014). The 2014 update further illustrated a potential divide between the dissemination of empirically supported results and the information needed for practitioners to make use of these data; there were many cases where specific details were absent and/or treatment programs or manuals were unavailable. In addition, lack of specific detail about the training of therapists or about the therapists' prior experience with CBT was noted as an obstacle.

At the point of the last update, CBT was the best studied and most efficacious psychosocial treatment for OCD. We had begun to consider what might constitute the core ingredients of treatment (e.g., ERP alone, ERP + cognitive strategies) and a broader range of treatment responses (e.g., global functioning, quality of life). However, there were a number of areas that remained to be addressed, particularly with regard to study methodology. This was in part because some of the most rigorous studies of certain treatments had come from the same research groups (e.g., Franklin et al., 2011; Pediatric OCD Treatment Study [POTS] Team, 2004) and therefore lacked independence. The need for replication also stemmed from the fact that many of the variations of CBT for pediatric OCD had been tested only once and in some cases only in open trials. The relative absence of new approaches (both augmentation strategies and non-CBT interventions) to address the needs of non- and partial responders to our standard treatments was also of great concern.

Current Evidence Base Update for Pediatric OCD

In this third review of the evidence base for psychosocial OCD treatments, we aim to summarize the current state of the literature, reflect on progress toward past recommendations, and consider how the current evidence base can lead the field into the next wave of treatment innovations. In the first review of this series (Barrett et al., 2008), questions of central importance were related to understanding *what works* (i.e., treatment efficacy) for pediatric OCD. The second review (Freeman et al., 2014) established the probable efficacy of CBT and called to further advance the field by identifying *what works, for whom* (i.e., predictors and moderators of treatment efficacy). In both of these past evidence base updates, studies were organized according to the *type* of treatment (e.g., CBT, cognitive therapy) and the *format* of treatment (e.g., individual, family, group, etc.). In the years since the last published evidence base update, multiple meta-analyses have been completed examining the psychological treatment of OCD in children (Rosa-Alcázar et al., 2015) and of CBT for pediatric OCD more specifically (Ivarsson et al., 2015; McGuire et al., 2015; Öst, Riise, Wergeland, Hansen, & Kvale, 2016). The resounding conclusion from these studies is that there is robust support for CBT as the treatment of choice for pediatric OCD. Of additional note (and important to our thinking about the current update) is the fact that in all of these meta analyses, similar forms of CBT are treated as what has been considered in other areas as a single "treatment family" or "overarching treatment class" with shared "practice elements" (Dorsey et al., 2017; Higa-McMillan, Francis, Rith-Najarian, & Chorpita, 2016). Even when studies are split by type (e.g., more cognitive focus, more exposure focus), format (e.g., individual, family, group), or level of family involvement, the results remain consistent; all types and formats of CBT for pediatric OCD tend to show large effect sizes and to outperform comparators. In the current review, this led us to carefully reconsider the organization of treatment categories (i.e., treatment program type and format) for the purposes of establishing an accurate and meaningful update to the evidence base.

We considered multiple factors when determining the most helpful organizing framework for this update. First, continuing the existing categories would more clearly identify trends and advancements in the field since the publication of the last two updates. These traditional categories also allow for more fine-grained analysis of treatment variants and approaches. However, in this review there are many studies using slightly different treatment packages, changes to format rather than content, and different types of control groups. Rather than being a limitation, variation of control group was often related to meaningful variation in central research questions designed to push the field forward. As such, organizing this update by type and format alone might limit the utility of our conclusions regarding these advances and obscure important next steps. When splitting only by type and format, the accumulation of evidence for individual CBT in the current review fell short of the *well-established* distinction rendered in recent meta-analyses. In many cases, distinguishing by format (particularly in the case of child and adolescent treatment where the lines between individual and family-focused CBT can be quite blurry) often feels like an artificial distinction not based on core treatment ingredients, proposed mechanism of action, or specific design of the study. Finally, we considered the practice utility of splitting by format, given shifting clinical service models away from hour-long office-based family or individual sessions (Lee et al., 2014).

As a result of the preceding considerations, we first propose a new organizational framework through which to consider these updates and then update the evidence base using the traditional categories. The literature we reviewed for the current update represented a clear departure from the questions of interest in prior eras and likely a change in research priorities; nearly all studies were designed to extend or improve upon the efficacy of CBT. Thus, the new framework will group studies according to the central question they were designed to address: treatment efficacy, improving treatment efficacy, or transporting efficacious treatment. Moving closer to the goal of understanding *for whom* CBT works, multiple studies examined *CBT efficacy* in new populations that were previously excluded from efficacy trials. A preponderance of studies in our review were designed to test ways of *improving CBT* with optimization and augmentation strategies, including some that tested tailored approaches for specific subgroups (e.g., nonresponders, high-conflict families). We also noted a shift toward studies that add to our understanding of what works, for whom, and *in what setting*. This includes studies that aim to *transport CBT* into community settings or using delivery modifications (e.g., non-face-to-face treatment formats), strategies that may eventually improve access to treatment for youth and families.

Organizing our update by format alone may obscure answers to some of these important questions; in our view, these questions are essential to advancing treatments for pediatric OCD. Similarly, each past update has emphasized the importance of understanding not only which treatments work and for whom but *why* they work—building knowledge about the underlying processes through which therapeutic change occurs (Kazdin, 2009). In this review, we newly consider the role of *treatment-specific therapy processes—how* treatment works—for accelerating knowledge about mechanism and treatment quality. Finally, continuing the tradition of offering an agenda for advancing future OCD treatment outcome research, we propose several key areas in which progress is needed; these align with emerging trends in our field and include carefully defined

studies of treatment mechanism (at multiple levels, including behavioral and biological), studies of therapy process and quality, and an emphasis on aspects of treatment that are most relevant for dissemination and implementation.

METHOD

Study Identification and Selection Criteria

The current article provides a comprehensive review of the psychosocial treatment literature for child and adolescent OCD that has been published between 2013 and 2017, updating the review published by Freeman, Garcia, and colleagues (2014), which covered studies published from 2007 to 2012. Thus, studies reviewed in the previous update are not included here. As has been the convention in former updates, purely pharmacological interventions for OCD are not reviewed here (see Bloch & Storch, 2015; Ivarsson et al., 2015; Öst et al., 2016; Varigonda, Jakubovski, & Bloch, 2016). That said, to the extent that studies described next included combined (medication and psychosocial) treatment arms, we have included them in the review as they represent a key research area and inform psychosocial clinical practice.

The majority of pediatric psychosocial treatments that met inclusion criteria for the present review (see the following criteria) utilize CBT (24 of 26 studies). As in the last update, some studies used full or stand-alone CBT packages, whereas others augmented CBT (e.g., with medication or cognitive bias modification), changed the frequency of treatment delivery (e.g., intensive treatment), altered the number of participants (e.g., family-focused models), or changed the model of service delivery (e.g., phone or Internet). Unlike the last review, the majority (16 of 26) of studies were RCTs, the level of methodological rigor was high, and there were more treatments aimed at younger children and treatment resistant youth. Of note, in the 2008 review, there were only four published RCTs in pediatric OCD. That number grew to 13 (nine additional RCTS) in 2014, and for this review a total of 29 (16 additional RCTs).

Studies were identified through searches of Medline and PubMed (keywords: *obsessive compulsive disorder* or *obsessive behavior, exposure therapy* or *behavior therapy* or *cognitive-behavior therapy* or *treatment*, and *children* or *adolescents* or *pediatric*), and supplemented with meta analyses, review articles, and studies cited in identified papers. These criteria yielded 341 peer-reviewed articles for consideration (246 after duplicates were removed). All studies were reviewed by at least two authors, and if they appeared to meet selection criteria, a formal data extraction form was completed; the authors determined that 26 would be retained for the current review (see Figure 1). Retaining the criteria applied in Barrett et al. (2008) and Freeman, Garcia, et al. (2014), all studies were written in English, involved more than one participant (we have continued the tradition of including open trials in this update in order to increase the ability to identify new and novel interventions), included children and adolescents 18 years old and younger, required participants to have a primary or co-primary diagnosis of OCD, and reported on OCD targeted symptom outcome measures at posttreatment. Exclusion criteria included nontreatment studies, psychopharmacological or biological interventions only, secondary outcome studies, single case studies, and reviews.

Each included study was categorized according to the two frameworks just described (see Table 1). For the purposes of this classification, CBT was defined as a "family-focused" treatment when parents or family members were consistently integrated throughout all of treatment, rather than just at predetermined points (e.g., psychoeducation, select parent sessions). Again, this definition reflects the rule established by Barrett et al. (2008) and Freeman, Garcia, et al. (2014) and serves to distinguish between systematic parental participation in treatment and the basic degree of parental involvement necessitated when working with children or adolescents. Although non-family-focused group CBT was a category in the last review, there were no new studies in this category. After articles were reviewed and classified, treatments were assigned an evidence base level according to criteria described next; these were initially discussed among the first three authors and further reviewed by the remaining authors before finalizing classifications. Specific details about all of the selected studies can be found in Table 2.

Southam-Gerow and Prinstein's (2014) evidence base–level criteria (based on criteria introduced by Chambless et al., 1996, and elaborated on by Lonigan, Elbert, & Johnson, 1998, and Silverman & Hinshaw, 2008) include *well-established* (Level 1),*probably efficacious* (Level 2), *possibly efficacious* (Level 3), *experimental* (Level 4), and treatments of *questionable efficacy* (Level 5), as outlined in Table 3. In addition to requiring explicitly delineated levels of empirical support, a number of methodological criteria are included in these guidelines. The most rigorous studies must be RCTs, use treatment manuals, clearly define inclusion criteria, administer reliable and valid assessment measures, and employ appropriate data analytic techniques. Level 1 and Level 2 treatment studies must satisfy all five of these criteria. Level 3 and Level 4 treatment studies do not need to be RCTs, although they do need to fulfill the other four methods criteria. To be classified as a Level 3 treatment, efficacy must be demonstrated by at least one additional peer-reviewed study. There are no other stipulations for classification as a Level 4 treatment. Many Level 3 and Level 4 studies are open trials and pilot studies with small sample sizes, and treatments classified as Level 5 are

FIGURE 1
Consort Diagram

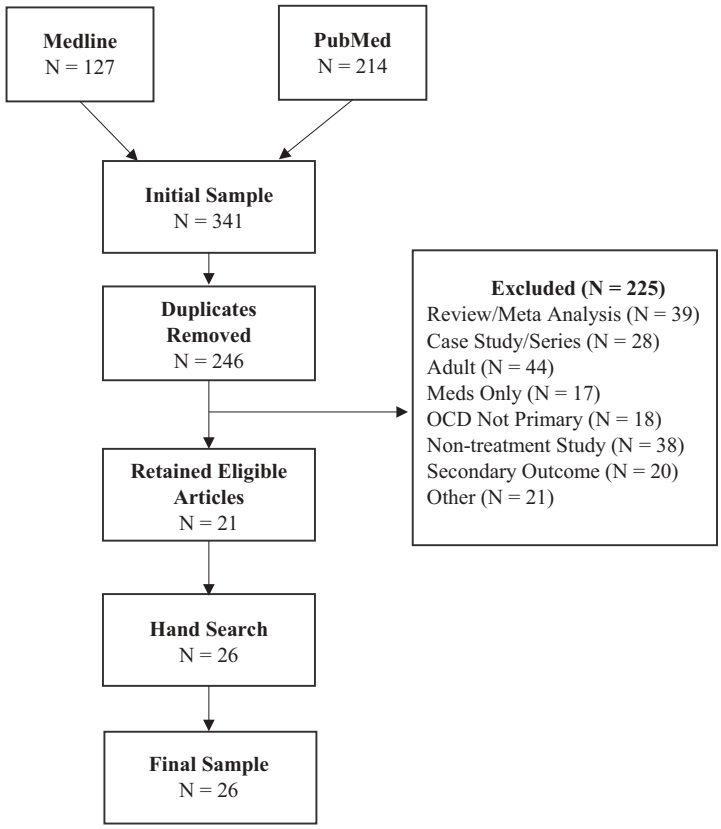

FIGURE 1 Consort diagram.

those tested with a good group design but found to be inferior to other treatments or to waitlist control.

RESULTS

Review of the Psychosocial Treatment Literature in Pediatric OCD: What Works?

With the exception of two studies, all new trials published since 2014 and meeting selection criteria for this review used CBT with ERP as the primary treatment. Most research since the last review has focused on understanding how to refine and improve the efficacy of CBT for pediatric OCD rather than testing CBT as a stand-alone intervention. As previously discussed, we first review treatment updates according to a new framework that is guided by central research goals and design of individual studies: CBT efficacy studies, studies that aim to improve CBT outcomes, and studies that aim to transport CBT. To facilitate comparison with prior evidence base updates, we then briefly review studies using the traditional categories (treatment type and format): individual CBT, family-focused CBT, non-face-to-face/technology CBT, family-focused group and non-family-focused group CBT, and other.

New Framework: Central Research Goal

What Works: Treatment Efficacy Studies

Studies in this category were designed to test treatment efficacy using a controlled or uncontrolled design. Since the 2014 review, three studies have specifically examined CBT efficacy; all of these were designed to extend CBT efficacy for OCD populations that have been typically excluded from previous trials, including young children and individuals with Pediatric Acute-onset Neuropsychiatric Syndrome (PANS). Of note, youth with autism spectrum disorder are another population excluded from most trials. Although there have been a number promising studies in this area, none met inclusion criteria for this review (Murray, Jassi, Mataix-Cols, Barrow, & Krebs, 2015; Russell et al., 2013; Wolters, De Haan, Hogendoorn, Boer, & Prins, 2016). Two small studies were designed to

TABLE 1
Two Organizational Framework and Reviewed Studies

By Research Question	*Treatment Type and Format*
CBT Efficacy	Individual CBT
Armstrong et al. (2013)	Mataix-Cols et al. (2014)
Freeman, Sapyta, et al. (2014)	Salemink et al. (2015)
Lewin et al. (2014)	Storch et al. (2013)
Nadeau et al. (2015)	Sukhodolsky, Gorman, et al. (2013)
Rezvan et al. (2013)	Family-Focused CBT
Treatment Augmentation and Optimization	Farrell et al. (2013)
Farrell et al. (2013)	Farrell et al. (2016)
Lebowitz (2013)	Freeman, Sapyta et al. (2014)
Mataix-Cols et al. (2014)	Lebowitz (2013)
Peris and Piacentini (2013)	Lewin et al. (2014)
Peris et al. (2017)	Nadeau et al. (2015)
Reynolds et al. (2013)	Peris and Piacentini (2013)
Rosa-Alcázar et al. (2017)	Peris et al. (2017)
Salemink et al. (2015)	Reynolds et al. (2013)
Storch et al. (2013)	Rosa-Alcázar et al. (2017)
Storch et al. (2016)	Skarphedinsson et al. (2014)
Sukhodolsky, Gorman, et al. (2013)	Storch et al. (2016)
Effectiveness and Delivery Modification	Torp et al. (2015)
Comer et al. (2016)	Whiteside et al. (2014)
Farrell et al. (2016)	Non-Face-to-Face CBT
Lenhard et al. (2014)	Comer et al. (2016)
Lenhard et al. (2017)	Lenhard et al. (2014)
Riise et al. (2016)	Lenhard et al. (2017)
Robinson et al. (2013)	Robinson et al. (2013)
Skarphedinsson et al. (2014)	Turner et al. (2014)
Torp et al. (2015)	Family-Focused Group CBT
Turner et al. (2014)	Riise et al. (2016)
Whiteside et al. (2014)	Other
	Armstrong et al. (2013)
	Rezvan et al. (2013)

Note: CBT = cognitive-behavioral therapy.

test the efficacy of new treatments: acceptance and commitment therapy and attachment-based therapy.

CBT for New Populations

Young Children. Despite clear evidence that OCD occurs in very young children, treatment efficacy research with this age group was limited in previous reviews. Since the 2014 review, significant advances have been made in evaluating the efficacy of CBT for young children with OCD. Freeman, Sapyta, and colleagues (2014) completed a multisite, randomized clinical trial (POTS Jr), comparing the efficacy of family-based CBT (FB-CBT) to an active control control condition, family-based relaxation (FB-RT) for 127 children ages 5–8. FB-CBT intervention was more efficacious than FB-RT in reducing OCD symptoms and functional impairment at post-treatment. In FB-CBT, 72% of children were treatment responders, compared to 41% in FB-RT. Similarly, Lewin and colleagues (2014) extended the delivery of CBT to 3 to 8 years olds (M = 5.8) with OCD, which is the youngest sample to date. Thirty-one young children were randomized to receive family-focused CBT or treatment as usual (as selected by families). The family-focused CBT condition had significantly better outcomes on all primary and secondary measures, and these gains were maintained during the 3-month follow-up period. The use of treatment as usual has methodological limitations, given that amount of contact cannot be balanced and not all participants elected an intervention in treatment as usual.

Summary. Combined results of the preceding studies support family-focused ERP as a tolerable, acceptable, and highly effective intervention for young children, and it could itself be considered *well-established* for this subgroup.

PANS. A subset of youth with OCD present with symptoms consistent with PANS; however, little is known about the efficacy of CBT with this particular phenotype of OCD. Barrett et al. (2008) noted one open trial (E. Storch et al., 2006) studying intensive CBT in a sample of seven youth with pediatric autoimmune neuropsychiatric disorders

TABLE 2
Studies Included in Review

Authors	*Framework*	*Sample*	*Treatment(s)*	*Trial Type*	*Measures*	*Results*	*Effect Size*	*Follow-Up*
Armstrong et al. (2013)	Other; Treatment Efficacy	*N* = 3, 12–13 years old, 1 female, Ethnicity: NR; Comorbidity: 1 ADHD	ACT – 8 to 10 weekly sessions	Multiple baseline design	CY-BOCS, ADIS-IV, Self-Monitoring of Compulsions, CDI, MASC, AFQ-Y, TEI-SF	CY-BOCS scores significantly reduced by 40% at post treatment and 43.8% at follow-up; Functioning impairment not assessed	NR	3 month
Comer et al. (2016)	Non-face-to-face CBT; Effective and Delivery Modification	*N* = 22, 4–8 years old, 40.9% female, Ethnicity: 91% White, Comorbidity: 18.2% separation anxiety, 18.2% social phobia, 22.7% GAD, 13.6% ADHD, 9.1% Specific Phobia	Internet Delivered FB-CBT – 14 weeks Clinic-based FB-CBT – 14 weeks	Pilot Trial (RCT)	CY-BOCS, CGI-S/I, FAS, CGAS, ADIS-IV-C/P, WAI, CSQ-8	Both forms of CBT delivery significantly reduced CY-BOCS scores; No significant condition differences; response rates increased for both conditions at follow-up Responders (CY-BOCS ≤ 15) Internet: 72.7% Clinic: 60.0% Responders (CGI-I ≤ 2) Internet: 72.7% Clinic: 60.0%	Between-Group: Internet-Clinic CY-BOCS = 0.09	6 month
Farrell et al. (2013)	Family-focused CBT; Treatment Augmentation and Optimization	*N* = 17 with difficult-to-treat OCD, 8–18 years old, 59% female, Ethnicity: 94% White, Comorbidity: 17.6% specific phobia, 47.1% GAD, 11.8% MDD, 5.9% SAD, 17.6% social phobia, 5.9% PTSD, 23.5% ADD/ADHD	ERP + DCS – 9 sessions of exposure with 5 sessions of DCS (25 or 50 mg); ERP + PBO – 9 sessions of exposure with 5 sessions of placebo	Pilot Trial (RCT)	CY-BOCS, CY-BOCS-SR, ADIS-P, CGI, NIMH-GOCS, MASC, ASC	No significant group differences at post treatment or 3 month. ERP+ DCS superior at 1 month; Responders (> 25% reduction on CY-BOCS) ERP + DCS – 100% ERP + PBO – 88% Remission (> 50% reduction + < 14 on CYBOCS) ERP+ DCS – 56% ERP+ PBO – 50% CGI-S ERP+ DCS: 2.67 ↓ ERP+ PBO: 2.75 ↓	Between-Group: DCS-PBO CY-BOCS = 0.00	1 month 3 month
Farrell et al. (2016)	Family-focused CBT; Effectiveness and Delivery Modification	*N* = 10, 11–16 years old, 4 females, Ethnicity: 100% White; Comorbidity: 1 separation anxiety, 1 social phobia, 5 GAD, 1 specific Phobia, 1 Panic Disorder	Intensive ERP + E-therapy maintenance program – 2 ERP sessions	Multiple Baseline Design	CY-BOCS, ADIS -P, NIMH-GOCS, CGI-S, MASC, CDI, PedsQL	Treatment significantly reduced CY-BOCS scores and CGI-S scores (2.5 ↓); response rates increased at follow-up; Responders (25% ↓ CY-BOCS) Posttreatment: 80% 6-month follow up: 80% Remission (50% ↓ CY-BOCS + CY-BOCS ≤ 14) Post-treatment: 60% 6-month follow up: 70%	Within-Group: CY-BOCS pre-post = 0.72	6 month
Freeman, Sapyta, et al. (2014)	Family-focused CBT; Treatment Efficacy	*N* = 127, 5–8 years old, 52.8% female, Ethnicity: 89.8% White, Comorbidity: 12.6% separation anxiety, 21.3% specific phobia, 11% social phobia, 19.7% GAD, 1.6% mood disorder, 22.8% tic disorders, 24.4% externalizing, 5.5% elimination disorder	FB-CBT – 12 sessions over 14 weeks; FB-RT – 12 sessions over 14 weeks	RCT	CY-BOCS, ADIS-IV, CGI-S/I, COIS-R, PQ-LES-Q	FB-CBT was superior to FB-RT on CY-BOCS; Responders (CGI score of 1 or 2): FB-CBT: 72% FB-RT: 41% CY-BOCS: FB-CBT: 12.83↓ FB-RT: 6.3↓ COIS-R: FB-CBT: 12.29↓ FB-RT: 6.94↓	Between-Group: FB-CBT-FB-RT CY-BOCS = 0.84	None
Lebowitz (2013)	Family-focused CBT; Treatment augmentation and Optimization	*N* = 6 parents of children who refused treatment, 10–13 years old, 2 female, Ethnicity: NR; Comorbidity: 2 ADHD, 3 additional anxiety disorder	Parenting for Anxious Childhood Emotions Program - 10 weekly sessions	Open Trial	CY-BOCS -PR, CD-POC, PARS, FAS, Client Satisfaction Questionnaire	CY-BOCS score reported by parent significantly improved by 17.6; functional impairment not reported	NR	None
Lenhard et al. (2014)	Non-face-to-face CBT; Effectiveness and Delivery Modification	*N* = 21, 12–17 years old, 61.9% female, Ethnicity: 95.2% Swedish; Comorbidity: 14.3% separation anxiety, 14.3% social phobia, 33.3% GAD, 23.8% ADHD, 38.1% specific Phobia, 9.5% depression, 4.8% conduct disorder	ICBT(BiP OCD) - 12 weeks	Open	CY-BOCS, ChOCI-R, COIS-R, CGI-S/I, CGAS, SCAS-C/P, CDI-S, SDQ, FAS-PR	40.8% ↓ in CY-BOCS scores; 12 classified as responders (≥ 35% ↓ on the CY-BOCS) and 10 achieved remission (CY-BOCS ≤ 12); significant reduction in impairment; improvement continued through 6 month follow up	Within-Group: CY-BOCS pre-post = 2.29	3 month 6 month

(*Continued*)

TABLE 2
(Continued)

Authors	*Framework*	*Sample*	*Treatment(s)*	*Trial Type*	*Measures*	*Results*	*Effect Size*	*Follow-Up*
Lenhard et al. (2017)	Non-face-to-face CBT; Effectiveness and Delivery Modification	*N* = 67, 12–17 years old, 46% female, Ethnicity: 93% Swedish; Comorbidity: 7% depression, 3% dysthymia, 7% panic disorder, 9% social anxiety disorder, 13% GAD, 9% ADHD, 13% specific Phobia, 1% PTSD, 6% tourette's syndrome	ICBT (BiP OCD) - 12 week Waitlist Control	RCT	CY-BOCS, ChOCI-R-C/P, CDI-S, SCAS-S-C/P, EWSAS-C/P, FAS-PR	ICBT was superior to waitlist; CY-BOCS scores continued to increase at follow-up; functional impairment not reported Responders (≥ 35% ↓ on the CY-BOCS) ICBT: 27% Waitlist: 0% Remission (CY-BOCS ≤ 12) ICBT: 15% Waitlist: 0%	Between-Group: ICBT-Waitlist CY-BOCS = 0.69	3 month
Lewin et al. (2014)	Family-focused CBT; Treatment Efficacy	*N* = 31, 3–8 years old, 29% female, Ethnicity: 87.1%, White, Comorbidity: 25.8% Separation anxiety, 38.7% social phobia, 35.5% GAD, 35.5% specific phobia, 41.9% ADHD, 35.5% ODD	Family-Based ERP – 12 sessions over 6 weeks; TAU	RCT	CY-BOCS, CGI-S/-I, ADIS-CSR, PPVT, PARS, NIMH-GOCS, SACA, FAS, CSDS, Satisfaction with services, Expectancy Rating	ERP was superior to TAU; treatment gains maintained at follow up; CY-BOCS total: ERP: 50.4% ↓ TAU: 3% ↑ Responders (CGI-I ≤ 2): ERP: 64.7% TAU: 7.1% Remission (CGI-S ≤ 3): ERP: 35.2% TAU: 0% Remission (CY-BOCS ≤ 12): ERP: 58.8% TAU: 0%	Between-Group: E/RP-TAU CY-BOCS = 1.69	1 month 3 month
Mataix-Cols et al. (2014)	Individual CBT; Treatment Augmentation and Optimization	*N* = 27, Age *M* = 14.96, 48% female, Ethnicity: NR, Comorbidity: 89% had secondary comorbid diagnosis (Social Anxiety, Specific phobia, GAD, BDD, Major Depression, Dysthymia, Tic Disorder, ADHD)	CBT + DCS – 14 sessions over 17 weeks (50 mg); CBT + PBO – 14 sessions over 17 weeks	Pilot Trial (RCT)	CY-BOCS, ChOCI-self, ChOCI-P, BDI-Y, CGAS, ADIS-IV	No significant group differences in CY-BOCS scores; Treatment gains continued to increase at 1 year follow-up; Responders (≥ 35% reduction on the CY-BOCS) DCS – 8 participants PBO – 9 participants Remission (CY-BOCS score ≤ 10) DCS – 7 participants PBO – 6 participants CGAS: DCS – 23.8↓ PBO – 25↓	Between-group: DCS-PBO CY-BOCS = 0.07	3 month 6 month 12 month
Nadeau et al. (2015)	Family-focused CBT; Treatment Efficacy	*N* = 11 children with OCD and PANS, 4–14 years old, 5 female, Ethnicity: 91% White; Comorbidity: NR	CBT - 14 sessions in person or via web camera	Open Trial	CY-BOCS, ADIS-IV-P, CGI-I/S, CGAS, SCARED, COIS-C/P, CBCL	Significant CY-BOCS reduction of 49% at post-treatment and 50% at follow-up; 100% responders (CGI-I ≤ 2);	Within-Group: CY-BOCS pre-post = 1.88	1–4 month
Peris and Piacentini (2013)	Family-focused CBT; Treatment Augmentation and Optimization	*N* = 20 poor functioning families, 8–17 years old, 45% female, Ethnicity: 60% White, Comorbidity: NR	PFIT – 12 sessions over 14 weeks; ST – 12 sessions over 14 weeks	Pilot Trial (RCT)	CY-BOCS, CGI-I ADIS-C/P, FES, FAS, PABS	PFIT superior to ST in treatment response; Treatment gains were maintained at follow-up Responders (CGI-I ≤ 2): PFIT: 70% ST: 40% Remission (CYBOCS ≤ 10): PFIT: 50% ST: 20%	Between-Group: PFIT-ST CY-BOCS = 0.65	3 month
Peris et al. (2017)	Family-focused CBT; Treatment Augmentation and Optimization	*N* = 62, 8–17 years old, 43% female, Ethnicity: 65% White; Comorbidity: 72.6% anxiety, 24.2% depression, 35.5% ADHD, 16.1% ODD/CD, 19.4% chronic tic/tourette, 8.1% autism spectrum	ST – 12 weeks PFIT – 12 weeks of ST with 6 PFIT sessions	RCT	CY-BOCS, ADIS-C/P, CY-BOCS, COIS-R, FAS, FES, PABS, CGI-I	PFIT superior to ST in treatment response; Treatment gains were maintained at follow-up Responders (CGI ≤ 2) ST: 40% PFIT: 68% Remission (CY-BOCS ≤ 14) ST: 27% PFIT: 58%	Between-Group: PFIT-ST CY-BOCS = 0.32	3 month
Reynolds et al. (2013)	Family-focused CBT; Treatment Augmentation and Optimization	*N* = 50, 12–17 years old Gender: NR, Ethnicity: 100% White, Comorbidity: 26% Separation anxiety, 58% social phobia, 66% GAD, 8% Panic 4% Agoraphobia with panic 12% Agoraphobia without panic 6% PTSD	Parent-enhanced CBT – up to 14 sessions; Individual CBT – up to 14 sessions	RCT	CY-BOCS, ADIS-IV C/P, BAI-Y, SMFQ	No significant group differences in CY-BOCS scores; treatment gains were maintained at follow-up; functional impairment not assessed; Individual CBT:10 ↓ Parent-enhanced CBT: 9.76 ↓	Between-Group: Independent CBT – Family-based CBT CY-BOCS = 0.001	6 month

Rezvan et al. (2013)	Other; Treatment Efficacy	*N* = 24, 10–12 years old, % female, Ethnicity: NR; Comorbidity: NR	Attachment-based intervention- 8 weeks Waitlist control	Pilot Trial (RCT)	CY-BOCS, DSRS, IPPA-R, IPPA, YBOCS, BDI,	Attachment-based intervention group (5.83↓) improved significantly more compared to control group (0.33↓) on the CY-BOCS; treatment gains maintained at follow-up; functional impairment not assessed	Between-Group: Attachment-Waitlist CY-BOCS = 0.828	1 month
Riise et al. (2016)	Family-focused CBT; Effectiveness and Delivery Modification	*N* = 22, 11–17 years old, 32% female, Ethnicity: 100% White; Comorbidity: 4 depression, 2 social phobia, 1 adjustment disorder, 1 Tourette's syndrome, 1 agoraphobia, 3 specific phobia	cET - 4 consecutive days of intensive ERP + 3 weeks of self-administered ERP	Open	CY-BOCS, K-SADS-PL, CDI, GAD-7, COIS-R	CY-BOCS scores decreased significantly by 19; Significant reduction in impairment measured by COIS-P; treatment gains maintained at follow-up 91% Responders (≥ 35% reduction on the CY-BOCS) and 72.7% in remission (CY-BOCS ≤ 12)	Within-Group: CY-BOCS pre-post = 4.67	3 month 6 month
Robinson et al. (2013)	Non-face-to-face CBT; Effectiveness and Delivery Modification	*N* = 8, 11–16 years old, 62.5% female, Ethnicity: 87.5% British White, 12.5% Portuguese; Comorbidity: 12.5% depression history, 12.5% anger and behavioral difficulties, 12.5% GAD	Self-help book – Breaking Free from OCD	Open	CY-BOCS, CHOCI-R, SDQ, Acceptability Questionnaire	18.5% reduction in CY-BOCS scores; functional impairment not assessed	NR	None
Rosa-Alcázar et al. (2017)	Family-focused CBT; Treatment Augmentation and Optimization	*N* = 20, 5–7 years old, 35% female, Ethnicity: 100% White; Comorbidity: 15% separation anxiety, 20% Specific Phobia	CBFT – 12 weekly sessions; involves both child and mother PT – 12 weekly sessions; only involves parent	Assigned alternately; 1:1 ratio to treatment condition	CY-BOCS, ADIS-C/P, CGAS, CBCL, FAS, Satisfaction Scale	Both forms of CBT delivery significantly improved CY-BOCS (CBFT: 12.3↓, PT: 11.9↓) scores and CGAS (CBFT: 22↑, PT: 15.5↑) scores; No significant condition difference; Treatment gains continued to increase at follow up Remission (CY-BOCS ≤ 12): CBFT:70% PT: 60%	NR	3 month
Salemink et al. (2015)	Individual CBT; Treatment Augmentation and Optimization	*N* = 16, 12–19 years old, 62.5% female, Ethnicity: NR, Comorbidity: NR	FB-CBT + CBM-I – 8 sessions in 11 days; FB-CBT + placebo – 8 sessions in 11 days	Pilot Trial (RCT)	CY-BOCS, RCADS, OBQ-CV, CDI	Significant CY-BOCS score decreases in CBM-I group; functional impairment not assessed; CBM-I: 4.3↓ Placebo: 2.4 ↓	Between-Group: CBM-I-TAU CY-BOCS obsessions = 0.64	None
Skarphedinsson et al. (2014)	Family-focused CBT; Effectiveness and Delivery Modification	*N* = 50 treatment resistant children, Age = 7–17 years old, 52% female Ethnicity: primarily Scandinavian, Comorbidity: 46% had secondary comorbid diagnosis (any depressive Disorder, any anxiety disorders, ADHD, ODD, CD, Tic disorders)	Sertraline – 6 sessions over 16 weeks. Started on 25 mg/day and titrated up to 100 mg/day by week 4 Continued CBT – 10 sessions over 16 weeks.	RCT	CY-BOCS, K-SADS-PL, COIS–R, AEs	No significant group differences in CY-BOCS scores; SRT demonstrated significantly lower on COIS-C scores but not on COIS-P scores; Responders (CY-BOCS < 16) CBT: 50% SRT: 45.4%	Between-Group: ContinuedCBT-SRT CY-BOCS = −0.29	None
Storch et al. (2013)	Individual CBT; Treatment Augmentation and Optimization	*N* = 47, 7–17years old, 38.3% female, Ethnicity: primarily White, Comorbidity: 51.1% internalizing disorders, 21.3% externalizing disorders, and 23.4% tic disorder	RegSert + CBT – 18 weeks on meds (150mg/day by 4 weeks), CBT at week 4; SloSert + CBT – 18 weeks on meds (150mg/day by 8 weeks), CBT at week 4; PBO + CBT – 18 weeks on placebo, CBT at week 4	RCT	CY-BOCS, CGI-S, MASC, COIS-C/P, CDRS-R, K-SADS-PL	No significant group differences in CY-BOCS scores; Responders (CY-BOCS ↓30%) RegSert+ CBT: 57.1% SloSert+ CBT: 64.7% PBO+ CBT: 62.5% Remission (CY-BOCS < 10) RegSert+ CBT: 42.9% SloSert+ CBT: 23.5% PBO+ CBT: 18.8% CGI-S RegSert+ CBT: 1↓ SloSert+ CBT: 1.17↓ PBO+ CBT: 1.26↓	Between-Group: RegSert+ CBT-SloSert+ CBT CY-BOCS = 0.20 Between-Group: RegSert+ CBT-PBO + CBT CY-BOCS = 0.02 Between-Group: SlowSert+ CBT-PBO + CBT CY-BOCS = 0.23	None
Storch et al. (2016)	Family-focused CBT; Treatment Augmentation and Optimization	*N* = 142, 7–17 years old, 53.5% female, Ethnicity: 88.7% White, Comorbidity: 81% had comorbid diagnosis (GAD, social phobia, ADHA, depressive disorder, separation anxiety disorder)	FB-CBT + DCS (25 or 50mg) – 10 sessions in 8 weeks; FB-CBT + Placebo– 10 sessions in 8 weeks	RCT	CY-BOCS, CGI, CDRS, MASC, COIS-P, KSADS-PL	No significant group differences in CY-BOCS scores; Responders (CY-BOCS ≤ 14) DCS: 42% PBO: 44% Responders (CGI-I ≤ 2) DCS: 58% PBO: 52% Remission (CY-BOCS ≤ 12) DCS: 35% PBO: 33%	NR	None
Sukhodolsky, Gorman, et al. (2013)	Individual CBT; Treatment Augmentation and Optimization	*N* = 6 children with OCD+ ODD, 8–14 years old, 1 female; Ethnicity: NR; Comorbidity: 6 ODD, 1 GAD, 4 ADHD, 1 Specific Phobia, 1 Tourette syndrome, 1 trichotillomania, 1 Depression	ERP + PMT – 6 weeks of PMT + 12 weeks of ERP ERP – PMT – 6 weeks of waitlist + 12 weeks of ERP	Multiple Baseline design	CY-BOCS, DBRS, K-SADS-PL	ERP + PMT group saw a significant reduction in CY-BOCS scores but no significant condition differences in reducing disruptive behavior; functional impairment not assessed; CY-BOCS score ERP + PMT: 39% ↓ ERP – PMT: 10% ↓ DBRS score ERP + PMT: 26.5% ↓ ERP – PMT: 37% ↓	NR	None

(*Continued*)

TABLE 2
(Continued)

Authors	*Framework*	*Sample*	*Treatment(s)*	*Trial Type*	*Measures*	*Results*	*Effect Size*	*Follow-Up*
Torp et al. (2015)	Family-focused CBT; Effectiveness and Delivery Modification	*N* = 269, 7–17 years old, 51.3% female, Ethnicity: 97% Scandinavian; Comorbidity: 19.3% anxiety disorders, 3.7% depressive disorders, 3.7% ODD/CD, 8.9% ADHD, 18.6% tics	ERP – 14 weekly sessions	Open	CY-BOCS, K-SADS-PL	CY-BOCS score significantly reduced by 52.9% at posttreatment; 72.6% Responders (CY-BOCS ≤ 15); functional impairment not assessed	Within-Group: CY-BOCS pre-post = 1.58	None
Turner et al. (2014)	Non-face-to-face CBT; Effectiveness and Delivery Modification	*N* = 72, 11–18 years old, 46% female, Ethnicity: NR, Comorbidity: 54.16% another anxiety disorder 9.7% depression or dysthymia 8.3% tic disorder or Tourette syndrome, 1.4% ADHD 1.4% ODD 1.4% BDD 1.5% eating disorder	TCBT – 14 sessions in 17 weeks; Clinic-based CBT – 14 sessions in 17 weeks	RCT	CY-BOCS, ChOCI-P/C, BDI-Y, SDQ -C/P, DASS, ADIS-IV-C/P, CGAS, CGI-I, FAS-P, DASS-P	No significant group differences on CY-BOCS scores, CGAS, or CGI-I; treatment gains maintained at follow-up; Responders (CY-BOCS reduction ≥ 35%) CBT: 90.6% TCBT: 87.5% Remission (CY-BOCS ≤ 12) CBT: 60.6% TCBT: 58.8%	NR	3 month 6 month 12 month
Whiteside et al. (2014)	Family-focused CBT; Effectiveness and Delivery Modification	*N* = 22, 7–18 years old, 31.8% female, Ethnicity: 90.5% White, Comorbidity: 72.7% had comorbid diagnosis (GAD, ADHD, phobia, MDD)	5-day intensive ERP	Open	CY-BOCS, ADIS:C, SCAS-C/P, COIS-C/P, CDI, FAI	Significant reductions in CY-BOCS (from *M* = 24.79 to *M* = 15.67); At follow up, CY-BOCS scores continued to improve and COIS-C/P saw significant reductions from baseline scores	Within-Group: CY-BOCS pre-post = 1.37	3 month

Note: ACT = Acceptance and Commitment Therapy; ADD = Attention deficit disorder; ADHD = Attention-Deficit/Hyperactivity Disorder; ADIS- IV = Anxiety Disorders Interview Schedule for DSM-IV; ADIS-IV-C/P = Anxiety Disorders Interview Schedule for DSM-IV: Children and Parent Version; ADIS-CSR: Anxiety Disorders Interview Schedule for DSM-IV Clinician Severity Rating; AEs = Adverse Events; AFQ-Y = Avoidance and Fusion Questionnaire for Youth; ASC = Adverse Symptoms Checklist; BAI-Y = Beck Anxiety Inventory for Youth; BDD = Body Dysmorphic Disorder; BDI-Y = Beck Depression Inventory for Youth; CBCL = Child Behavior Checklist; CBFT = Cognitive-Behavioral Family-Based; CBM-I = Cognitive Bias Modification of Interpretation Training; CBT = Cognitive Behavioral Therapy; CD = Conduct Disorder; CDI = Children's Depression Inventory; CD-POC = Coercive Disruptive Behavior Scale for Pediatric OCD; CDRS = Children's Depression Rating Scale; CDRS-R = Children's Depression Rating Scale – Revised; cET = concentrated Exposure Treatment; CGAS = Children's Global Assessment Scale; CGI-S = Clinical Global Impression- Severity Scale; CGI-I = Clinical Global Impression – Improvement Scale; CHOCI = Children's Obsessional Compulsive Inventory; CHOCI-C/P = Children's Obsessional Compulsive Inventory – Child and Parent Version; COIS = Child Obsessive Compulsive Impact Scale; COIS-C/P = Child Obsessive Compulsive Impact Scale – Child and Parent Version; COIS-R = Child Obsessive Compulsive Impact Scale – Self Report; CSDS = Child Sheehan Disability Scale; CSQ-8 = Client Satisfaction Questionnaire; CY-BOCS = Children's Yale-Brown Obsessive-Compulsive Scale; CY-BOCS-SR = Children's Yale-Brown Obsessive-Compulsive Scale – Parent Self-Report; DASS-P = Depression Anxiety Stress Scale- Parent Version; DBRS = Disruptive Behavior Rating Scale; DCS = D-Cycloserine; DSRS = Depression Self-Rating Scale; ERP = Exposure and Response Prevention; EWSAS - C/P = Education, Work, and Social Adjustment Scale Child/Parent; FAI = Family accommodation Items; FAS = Family Accommodation Scale; FB-CBT = Family Based Cognitive Behavioral Therapy; FB-RT = Family Based Relaxation Therapy; FES = Family Environment Scale; GAD = Generalized Anxiety Disorder; GAD-7 = The Generalized Anxiety Disorder Scale; ICBT = Internet-delivered Cognitive Behavioral Therapy; IPPA = Inventory of Parent and Peer Attachment; IPPA-R = Inventory of Parent and Peer Attachment - Revised version for Children; KSADS-PL = Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime Version; MDD = Major Depressive Disorder; NR = Not Reported; OBQ-CV = Obsessive Beliefs Questionnaire – Self Report; OCD = obsessive-compulsive disorder; ODD = Oppositional Defiant Disorder; MASC = Multidimensional Anxiety Scale for Children; NIMH -GOCS = National Institute of Mental Health – Global Obsessive Compulsive Scale; PABS = Parental Attitudes and Behavioral Scale; PARS = Pediatric Anxiety Research Scale; PedsQL = The Pediatric Quality of Life Inventory; PBO = Placebo; PFIT = Positive Family Interaction Therapy; PMT = Parent Management Training; PPVT = Peabody Picture Vocabulary Test; PT = Parent Training; PTSD = Post Traumatic Stress Disorder; PQ-LES-Q = Quality of Life Enjoyment and Satisfaction Questionnaire; RCT = Randomized Controlled Trial; RegSert = Regular Sertraline; RCADS = Revised Children's Anxiety and Depression Scale; RCT = Randomized Controlled Trial; SACA = Service Assessment for Children and Adolescents – service use scale; SAD = Separation Anxiety Disorder; SCAS-C/P = Spence Children's Anxiety Scale – Child and Parent Version; SDQ-C/P = Strengths and Difficulties Questionnaire – Child and Parent Version; SloSert = Slow Sertraline; SMFQ = Short Mood and Feelings Questionnaire; SRT = Sertraline; ST = Standard Treatment; TAU = Treatment as Usual; TCBT = Telephone CBT; TD = Tic Disorders; TEI-SF = Treatment Evaluation Inventory - Short Form; WAI = Working Alliance Inventory; YBOCS = Yale-Brown Obsessive-Compulsive Scale Inventory

TABLE 3
Journal of Clinical and Child Adolescent Psychology Evidence Base Updates Evidence-Based Treatments Evaluation Criteria

Methods Criteria
M.1. Group design: Study involved a randomized controlled design
M.2. Independent variable defined: Treatment manuals or logical equivalent were used for the treatment
M.3. Population clarified: Conducted with a population, treated for specified problems, for whom inclusion criteria have been clearly delineated
M.4. Outcomes assessed: Reliable and valid outcome assessment measures gauging the problems targeted (at a minimum) were used
M.5. Analysis adequacy: Appropriate data analyses were used and sample size was sufficient to detect expected effects
Level 1: Well-Established Treatments
Evidence criteria
1.1. Efficacy demonstrated for the treatment in at least two (2) independent research settings and by two (2) independent investigatory teams demonstrating efficacy by showing the treatment to be either:
1.1.a. Statistically significantly superior to pill or psychological placebo or to another active treatment
OR
1.1.b. Equivalent (or not significantly different) to an already well-established treatment in experiments
AND
1.2. All five (5) of the Methods Criteria
Level 2: Probably Efficacious Treatments
Evidence criteria
2.1. There must be at least two good experiments showing the treatment is superior (statistically significantly so) to a waitlist control group
OR
2.2. One or more good experiments meeting the Well-Established Treatment level with the one exception of having been conducted in at least two independent research settings and by independent investigatory teams
AND
2.3. All five (5) of the *Methods Criteria*
Level 3: Possibly Efficacious Treatments
Evidence criterion
3.1. At least one good randomized controlled trial showing the treatment to be superior to a wait list or no-treatment control group
AND
3.2. All five (5) of the *Methods Criteria*
OR
3.3. Two or more clinical studies showing the treatment to be efficacious, with two or more meeting the last four (of five) *Methods Criteria*, but none being randomized controlled trials
Level 4: Experimental Treatments
Evidence criteria
4.1. Not yet tested in a randomized controlled trial
OR
4.2. Tested in one or more clinical studies but not sufficient to meet Level 3 criteria.
Level 5: Treatments of Questionable Efficacy
5.1. Tested in good group-design experiments and found to be inferior to other treatment group and/or waitlist control group; that is, only evidence available from experimental studies suggests the treatment produces no beneficial effect.

Note: Criteria added from Silverman and Hinshaw (2008) and Division 12 Task Force on Psychological Interventions' reports (Chambless et al., 1998, 1996), from Chambless and Hollon (1998), and from Chambless and Ollendick (2001). Chambless and Hollon (1998) described criteria for methodology.

associated with streptoccocal infection (PANDAS), finding that 86% of youth had a Clinical Global Impression Scale (CGI) score less than 2 at posttreatment. Nadeau and colleagues (2015) completed a second open trial of 11 youth (ages 4–14) who met criteria for PANS-related OCD and did not achieve symptom remission after 4 weeks of antibiotic treatment. Children's Yale-Brown Obsessive-Compulsive Scale (CY-BOCS) ratings significantly improved for youth who completed CBT treatment (n = 8) with effect sizes similar to the POTS (2004) trial. Despite the combined support in these preliminary studies, this population is particularly difficult to evaluate given the characteristic episodic nature of symptoms, which further limits how much we can attribute gains to CBT as opposed to natural remittance without a control group. More methodologically rigorous studies are needed to fully understand if the efficacy of CBT for PANS-related OCD will be as effective as CBT for pediatric OCD in the general population.

Summary. Based on these two small open trials, CBT specific to youth with PANS/PANDAS-related OCD remains an *experimental* treatment.

Acceptance and Commitment Therapy (ACT)

In the adult OCD literature, ACT is an efficacious and acceptable treatment (Twohig, Whittal, Cox, & Gunter, 2010), and ACT principles are often utilized in clinical

practice for pediatric OCD. Although it has similarities to traditional CBT, ACT is associated with theoretically different mechanisms of change. Armstrong and colleagues (2013) used a multiple baseline design with three 12- and 13-year-olds to test an eight-session ACT intervention (two additional sessions were optional). The primary outcome was daily self-monitoring of compulsions, which on average resulted in a 40% decrease at posttreatment and 43.8% at 3-month follow-up, and treatment was acceptable to families. Future studies will need to include larger sample sizes with more rigorous study designs.

Summary. Based on these results, ACT is considered an *experimental* treatment at this time.

Attachment-based therapy

Rezvan and colleagues (2013) assessed the efficacy of an attachment-based intervention, randomizing 24 treatment naive youth with OCD, ages 10–12, to 8 weeks of treatment or nontreatment control. Authors provide a summary of each session of this intervention, which included examples such as education about attachment and attachment needs and role-playing exercises between child and mother on various processes (e.g., connecting and separating from each other, reducing reinforcement and blame for rituals, maintaining emotional closeness during conflict). The treatment group had significantly lower OCD symptoms than the control condition at posttreatment and 1-month follow-up. Additional research is needed, as this study had a small sample size and was limited to females and their mothers.

Summary. Based on these results, attachment-based therapy is considered an *experimental* treatment at this time.

Improving What Works: Treatment Augmentation and Optimization Studies

Whereas studies in the previous category were designed to test the efficacy of treatments themselves, *studies in this category were designed to test new ways that efficacious treatments might be improved or optimized*. In the current article, all such studies focused on CBT; some of these studies used approaches designed to improve outcomes for specific subgroups. The number of studies in this area (11) represents one of the notable advances since the previous review. We describe these studies according to the nature of the tested approach: CBT + DCS, CBT + sertraline, CBT + cognitive bias modification of interpretation, and optimizing family support in CBT.

CBT + DCS

The DCS, an N-methyl-D-aspartate agonist, facilitates fear extinction in animal studies and has been investigated as an augmentation for CBT in adults (Davis, Ressler, Rothbaum, & Richardson, 2006; Ledgerwood, Richardson, & Cranney, 2005; Norberg, Krystal, & Tolin, 2008). Initial use in pediatric OCD (E. Storch et al., 2010) found no significant differences between groups (CBT + DCS and CBT + placebo), but DCS was well tolerated. Since the last review, three additional studies have tested DCS with exposure-based CBT for youth with OCD. Mataix-Cols and colleagues (2014) randomized youth (n = 27) to CBT + DCS versus CBT + placebo. Participants received 10 doses of DCS/placebo *after* each exposure session. Both groups improved, but there were no significant differences between groups. Storch and colleagues (2016) randomized 142 youth with OCD (ages 7–17) to CBT + DCS versus CBT + placebo. Participants received seven doses of DCS or placebo 1 hr *prior to* exposure sessions. Although well powered, there were no differences between groups. Combined, results of these new studies support previous research indicating that DCS is a well-tolerated treatment but that it does not add benefits to CBT as administered and tested in these studies for pediatric OCD.

In an effort to test this innovative augmentation in a treatment refractory population, Farrell et al. (2013) randomized 17 youth with OCD who were not improving after a minimum of six CBT sessions including exposure to receive either DCS or placebo pill prior to five subsequent exposure sessions. There were no significant differences between groups at posttreatment and a 3-month follow-up. At 1-month follow-up, the DCS group demonstrated greater improvement on a subset of outcomes (e.g., clinician-rated obsessional severity, diagnostic severity, parent ratings of OCD severity).

Summary. Based on these studies, CBT+ DCS is technically *probably efficacious* in that the treatment has been shown to be equivalent to an already well-established intervention (e.g., family-focused CBT) in one trial with a sufficient sample size. However, given that DCS is a medication augmentation strategy for CBT, if the combined treatment is truly no different than CBT alone, then its utility is questionable. The evidence just reviewed does not support the efficacy of CBT + DCS over CBT alone, and therefore it is unclear whether the *probably efficacious* label makes sense in this context. As addressed next, ongoing work is needed to understand more fully the effects and potential of DCS in combination with exposure.

CBT + Sertraline

The combined treatment of sertraline and CBT has been identified as an effective treatment for pediatric OCD for well

over a decade (POTS Team, 2004); however, the incremental benefits of CBT plus sertraline compared to CBT alone remain unclear. Storch and colleagues (2013) examined clinical outcomes for youth (n = 47) randomized to standard dosing sertraline + CBT, slow sertraline + CBT, or placebo + CBT. Large within-group effects were found across conditions for primary outcome measures (CY-BOCS and CGI–Severity Scale), and all groups improved at a comparable rate, suggesting that CBT alone performed equally well to combined therapy. Notably, this was a moderately severe OCD sample, and it is possible that subgroups of youth, such as those with more severe OCD or those that are CBT nonresponders, may have a relative benefit with combined therapy.

Summary. The combination of CBT and sertraline has been shown to be superior (depending on the definition of primary outcome; POTS Team, 2004) or equivalent (Storch et al., 2013) to individual CBT alone in two independent, controlled studies. Because individual CBT alone remains as a *probably efficacious* treatment (see the upcoming Traditional Framework section), the combination of these two studies classify CBT + sertraline as *probably efficacious* according to current criteria. That said, just as we discussed earlier in reference to the DCS augmentation of CBT, if these results suggest medication augmentation of CBT is equivalent to CBT alone, then the argument in favor of its use may be questionable. It may be that with augmentation strategies being added to existing treatments, the bar should be set higher than noninferiority for such a test. We return to this issue in the discussion but also acknowledge that there are many complicated questions concerning medication augmentation of CBT, particularly in treatment resistant youth, that are well beyond the scope of this review.

CBT + Cognitive Bias Modification of Interpretation (CBM-I)

CBM-I has emerged as an intervention to alter interpretation biases and potentially reduce anxiety; however, little is known about its applicability to the treatment of pediatric OCD. Salemink, Wolters, and De Haan (2015) examined whether adding eight sessions of OC specific CBM-I enhanced CBT for adolescents with OCD. Participants completed either OC specific CBM-I training (n = 9) or a placebo training (n = 7). The CBM-I condition had a change in the speed for OC-related immediate (online) interpretations relative to the placebo group, but no group differences were found for offline, retrospective interpretations. Clinical outcomes showed CBM-I had fewer patient-reported OC symptoms as well as fewer clinician-rated obsessions than the placebo group.

Summary. Although the strength of using an RCT allows us to state with more confidence that CBM-I training may have added benefit to CBT, the very small sample size suggests that these results should preliminary and more research is needed. At present, given the very limited data in pediatric OCD, augmentation of CBT with CBM-I in youth can be considered an *experimental* treatment.

Optimizing Family Support in CBT

A number of studies since the last review have evaluated the role of family support during treatment for optimizing CBT outcomes; some did so with the explicit goal of targeting family support approaches to the needs of specific subgroups. At a basic level, we know that family involvement is a hallmark of most pediatric treatments; however, the amount of family involvement needed for optimal treatment response in pediatric OCD remains an empirical question. Reynolds et al. (2013) randomized 50 adolescents, ages 12–17, to receive a 14-session manualized CBT intervention with either high or low parental involvement. Both groups saw significant reduction of OCD symptoms; no significant differences in treatment response were found between groups. The small sample size limits our ability to confirm that level of parental involvement does not add additional benefit. Moreover, the relation between family involvement and clinical improvement is likely complex and may be most relevant to certain populations, such as young children and those with challenging family dynamics.

Rosa-Alcazar et al. (2017) compared the efficacy of cognitive-behavioral family-focused treatment to parent training without child participation in a young sample (n = 20), ages 5–7. The same treatment protocol was used in both groups, with the parent training condition attended by only mothers rather than both parent and child. Both conditions improved significantly on measures of OCD symptom severity, global functioning, and family accomodation with no significant group differences. Although this study demonstrates initial feasibility of a parent-only intervention for young children with OCD, similar to the Reynolds et al. (2013) publication, limited conclusions can be drawn due to the small sample sizes. Lebowitz (2013) also studied a parent-only intervention, the Supportive Parenting for Anxious Childhood Emotions Program, for youth with OCD in a small open trial (n = 6), which was targeted for a subset of youth who refused individual CBT treatment. Exposure-based CBT requires active participation, and there is a paucity of data for children refusing treatment. Results provide initial support for Supportive Parenting for Anxious Childhood Emotions as a feasible and acceptable intervention in terms of improved outcome and satisfaction. Combined, these two studies suggest that parent-only interventions for pediatric CBT may be a viable alternative to traditional individual or family-focused CBT interventions; however, more methodologically rigorous studies are needed.

Since the last review, three studies (Peris & Piacentini, 2013; Peris, Rozenman, Sugar, McCracken, & Piacentini, 2017; Sukhodolsky, Bloch, Panza, & Reichow, 2013) examined family-specific augmentation to traditional CBT interventions for OCD addressing predictors of poor treatment outcome,

including poor family functioning and co-occurring disruptive behavior. Two studies assessed whether the addition of an intensive family therapy module, positive family interaction therapy (PFIT), to CBT would be beneficial for families with poor functioning (e.g., conflict, blame, low cohesion; Peris & Piacentini, 2013; Peris et al., 2017). Both studies recruited families with poor family functioning and families received the same amount of intervention time, either standard treatment or standard treatment + PFIT. PFIT sessions aimed to shift family dynamics around conflict and blame and enhance cohesion, which have been found to predict poor OCD treatment response (Peris et al., 2012). Combined results from both studies show that PFIT is an acceptable and feasible intervention with positive clinical outcomes. In the most recent RCT (Peris et al., 2017), the PFIT group outperformed standard care on the CGI–Improvement Scale, OCD remission status, and secondary outcomes of family functioning, including reduced accommodation, reduced conflict, and improved cohesion. The augmentation of CBT treatment with PFIT for families with poor functioning fills an important gap in OCD research and is an exciting and promising intervention for youth with complex family dynamics.

Sukhodolsky, Gorman, and colleagues (2013) evaluated whether the addition of parent management training (PMT) enhanced use of CBT with ERP for a sample of children (n = 6), ages 9–14, with co-occurring OCD and oppositional defiant disorder using a multiple baseline design. All participants completed a 4-week baseline and then were randomly assigned to either 6 weeks of PMT or waitlist control followed by 12 sessions of ERP. The PMT + ERP condition had a 39% reduction in CY-BOCS score compared to 10% in the ERP-only condition. This study highlights the challenges of treating youth with OCD with comorbid disruptive behavior, as well as the feasibility and possible benefits of using PMT prior to initiating ERP with this subset of youth.

Summary. Overall, the addition of the PFIT program to standard CBT, as compared to CBT alone (Peris & Piacentini, 2013; Peris et al., 2017) has sufficient evidence to receive a label of *probably efficacious*, limited only by both studies being conducted by the same research group. Although the other treatment programs reviewed in this section are single trials and therefore have limited evidence, the addition of different forms of parent training, particularly when used in an identified subset of youth with co-occurring externalizing disorders, holds promise but would be considered an *experimental* treatment.

Transporting What Works: Effectiveness and Delivery Modification Studies

Unlike studies in the previous two categories, which were designed to test the efficacy of treatments and ways to improve upon efficacy, *studies in this category were designed to test whether treatment efficacy is retained when delivered in a new setting or with a new method*. Treatment access remains an important barrier for many youth with OCD. Problems with access may be due to geographical limitations, poor quality of services, lack of trained providers, long waitlists, or transportation (Comer & Barlow, 2014). Research in this area aims to close that gap.

Effectiveness Treatment Studies

The dissemination and study of the effectiveness of CBT for OCD in community settings continues to lag behind dissemination efforts for pediatric anxiety and depression (Weisz et al., 2013). As highlighted in the 2014 review, the low base rate of OCD is a barrier to studying the CBT treatment in community settings on a larger scale. A large effectiveness study across 20 community outpatient clinics in Denmark, Norway, and Sweden, the Nordic Long-term OCD Treatment Study (NordLOTS), tested exposure-based CBT for 269 youth, ages 7–17 (Torp et al., 2015). Intensity of therapist training varied based on their preexperience of treating pediatric OCD. For those with minimal CBT experience, therapists participated in a 10-day initial training on the treatment manual and follow-up monthly supervision; however, little information is provided about the structure or content of this supervision. Treatment response for completers (n = 241) was high (72.6%), offering initial support that CBT for OCD can be transported into community mental health settings.

Skarphedinsson et al. (2014) extended the work of the NordLOTS study to examine the efficacy of treatment options for youth who did not respond to an initial trial of CBT in a community sample. Treatment resistant youth were defined as a having CY-BOCS score of 16 or higher following 14 weeks of treatment. Youth (n = 54) were randomized to 10 additional individually modified CBT sessions or switched to sertraline only. Both conditions showed large within-group effect sizes demonstrating improvement with continued treatment over 16 weeks, and there was no significant difference in outcome between continued CBT or sertraline. Results suggest that youth with persistent symptoms after a sufficient trial of CBT (14 weeks) may benefit from continued treatment, either continued CBT or sertraline. This study does not provide information regarding the effectiveness of combined CBT and sertraline for treatment resistant youth.

Summary. Although these findings are extremely promising regarding the transportability of CBT for OCD, especially given the large sample size and inclusion of nonresponders, effectiveness research for pediatric OCD remains an area of needed research. Although the NordLOTS studies, with well-delineated methods and large sample sizes, are a significant and much-needed addition to this area of the literature, the absence of a control

group in the initial phase (Step 1 of larger study) would deem it *possibly efficacious* in this context despite family-focused CBT being well-established more broadly (although primarily in noncommunity settings).

Delivery Modification Studies

Alternatives to traditional weekly office-based outpatient therapy offer one solution to potentially increase access for families seeking treatment for pediatric OCD. Three avenues of modified CBT delivery have emerged to address this issue and are discussed: technology-based CBT, intensive or concentrated CBT treatment, and self-help bibliography.

Technology-Based Delivery of CBT. In the 2014 review, two studies provided preliminary support for the efficacy and acceptability of web-delivered CBT (E. A. Storch et al., 2011) and telephone-delivered CBT (Turner, Heyman, Futh, & Lovell, 2009). Findings were encouraging, but the results were limited by small sample sizes and the lack of active control groups. Since the 2014 review, five additional studies, including three RCTs, have evaluated the efficacy of web-based and telephone-based treatment for pediatric OCD.

Comer et al. (2016) examined the acceptability of Internet-delivered FB-CBT for early onset OCD (ages 4–8). Families (n = 22) were randomized to receive 14 weeks of FB-CBT in the clinic or via video-teleconferencing. Results indicated that treatment retention, engagement, and satisfaction were high in the Internet-delivered FB-CBT condition. In addition, response rates did not significantly differ from the clinic-based FB-CBT condition and were similar to other trials using clinic-based family-focused CBT for this age group (Freeman et al., 2008, 2014). Similarly, Turner and colleagues (2014) compared the efficacy of telephone cognitive-behavioral therapy (TCBT) to clinic based treatment. Seventy-two adolescents, ages 11–18, with primary OCD were randomized to receive CBT using ERP using identical treatment content either via telephone or in clinic. CY-BOCS scores were similar in both groups at all assessment points, with the exception of 12 months, where the confidence intervals scores exceeded the noninferiority threshold. Notably, satisfaction was high for TCBT. Results indicate that TCBT was not initially inferior to face-to-face delivery of CBT, which had similar treatment response rates when benchmarked against other trials.

Another group of researchers tested a novel Internet-delivered CBT platform, BiP (BarnInternetProjektet) OCD, for adolescents with OCD. The BiP OCD intervention is web-based with 12 chapters for youth and five for parents consisting of education materials, films, and exercises. The therapist role was to help guide patients through treatment, select homework assignments, and problem solve as needed. The initial pilot trial demonstrated good adherence to the program and positive clinical outcomes (Lenhard et al., 2014). Based on these findings, Lenhard and colleagues (2017) completed a follow-up RCT of 67 adolescents randomized to BiP OCD or waitlist. The BiP condition was superior to waitlist for CY-BOCS and weekly therapist support time averaged 17.5 min per patient. However, effect sizes were moderate and less than those typically found in OCD trials using face-to-face interventions.

Summary. Given the promising results of Comer et al. (2016) and Turner et al. (2014), technology-based CBT can be considered a probably efficacious treatment at this time. Due to the small sample size in the Comer et al. (2016) trial, this category is not yet *well-established*. What is truly novel about these delivery approaches is not the treatment content itself but rather that it might increase access to efficacious and often unavailable treatments for youth with OCD.

Intensive CBT Delivery. Another promising avenue to increase access to OCD treatment is the intensive delivery of CBT. In the previous review, there was emerging research demonstrating that intensive delivery of CBT and ERP was acceptable and efficacious for youth, though the time burden of these intensive treatments was noted as a possible disadvantage given that treatment occurred over a period of weeks (fourteen 90-min sessions over 3 weeks; total treatment dose = 21 hr; Storch et al., 2007). Newer research has tested the delivery of intensive treatment in even shorter durations (Farrell et al., 2016; Whiteside et al., 2014) and in group format (Riise et al., 2016).

Whiteside et al. (2014) evaluated a 5-day intensive treatment for 22 children and adolescents with OCD using twice-daily 50-min sessions of a traditional ERP treatment protocol for a total of 10 sessions (total treatment dose = 8 hr 20 min over 5 days). The treatment intervention emphasized parent coaching and how to continue ERP at home. To improve methodological rigor, researchers included a 4-week no-treatment waiting period and found no significant reductions in OCD symptoms during this baseline period. Independent assessment at posttreatment and 3-month follow-up found significant improvement in OCD symptom severity, functional impairment, and family accommodation. Farrell et al. (2016) uniquely combined intensive treatment with technology-based maintenance (e.g., weekly Skype call) using a multiple baseline design. Participants (n = 10), 11–16 years old, had a primary diagnosis of OCD and were randomized to either a 1- or 2-week baseline condition. Intensive treatment involved 1 hr of psychoeducation and two prolonged exposure sessions (3-hr sessions). E-therapy maintenance was 3 weeks of assistance with exposure via video call (treatment dose = 7 hr over 3 weeks + e-therapy maintenance over 3 weeks). Eighty percent of the sample were considered treatment responders at posttreatment and 6-month follow-up. Similarly,

Riise and colleagues (2016) studied the efficacy of concentrated exposure delivery for adolescents with OCD in a group format. In this open trial, 22 youth, ages 11–17, received concentrated Exposure Treatment (Havnen, Hansen, Haug, Prescott, & Kvale, 2013; Havnen, Hansen, Öst, & Kvale, 2014) over 4 consecutive days (treatment dose = approximately 12 hr over 4 days). Similar to the other trials, youth had a significant reduction in OCD symptoms and functional impairment and 91% were classified as responders.

Summary. Taken together, these three open trials add clear evidence that the intensive treatment delivery of CBT using ERP is a promising treatment modification with similar efficacy to more traditional outpatient formats. Similar to other areas of promising research in OCD treatment, more methodologically rigorous studies with an active comparison condition are needed to fully determine their efficacy and move this category beyond the level of possibly efficacious.

Self-Help CBT Studies. Last, another potential stepped care model approach to increase treatment access is the utilization of bibliotherapy for milder forms of pediatric OCD, but the efficacy of such approaches has not been tested. Robinson, Turner, Heyman, and Farquharson (2013) completed a case series for eight 11- to 16-year-olds assessing the feasibility and acceptability of a self-help book, *Breaking Free from OCD* (Derisley, Heyman, Robinson, & Turner, 2008). Weekly monitoring of symptoms using the CY-BOCS was completed for a 3-week baseline phase followed by an 8-week intervention phase. Results showed some reduction in CY-BOCS scores (18.5%) during the intervention phase but no difference on self-report measures. Notably, only three participants completed all chapters. Although bibliotherapy is a potentially low-cost and easily accessible intervention, this initial study showed limited effect.

Summary. Given the single open trial and limited effect of the intervention, CBT delivered as self-help would be considered an *experimental* treatment.

Traditional Framework: Treatment Type and Format

To facilitate comparison with prior evidence base updates (Barrett et al., 2008; Freeman et al., 2014), we briefly evaluate the same studies just reported, now using the traditional framework for evaluating treatment type (e.g., CBT) and format (e.g., individual, family).

Individual CBT. Four studies using individual CBT were identified since the last review (Mataix-Cols et al., 2014; Salemink et al., 2015; Storch et al., 2013; Sukhodolsky, Gorman, Scahill, Findley, & McGuire, 2013). Each of these, described in the preceding sections, compared individual CBT to the combination of individual CBT + another active treatment (CBT+ DCS: Mataix-Cols et al., 2014; CBT+ cognitive bias modification: Salemink et al., 2015; CBT+ sertraline: Storch et al., 2013; CBT+ parent management training: Sukhodolsky, Gorman, et al., 2013). Individual CBT was classified as probably efficacious in the 2014 evidence base update due to methodological differences (e.g., some with cognitive focus only) or limitations (e.g., lack of active controls) and the fact that the two largest trials at the time were completed by the same research group (Franklin et al., 2011; POTS Team, 2004). At this point in time, one would imagine that individual CBT would meet the definition of a well-established treatment; however, the studies in this category were not designed to test the efficacy of individual CBT (e.g., via replication studies or "head-to-head" trials), thus did not include a control condition without individual CBT and cannot be used to support the evidence base for efficacy of individual CBT—leaving individual CBT classified as probably efficacious. This is despite the data from multiple meta-analyses, which offer strong support to CBT for pediatric OCD more broadly. Overall, this dilemma further illustrates the challenges inherent with parsing studies by treatment format (e.g., individual vs. family) rather than examining CBT trials together to evaluate the efficacy of core CBT procedures.

Family-Focused CBT. In line with the clinical needs of children and adolescents, as well as research supporting the importance of family factors in pediatric OCD (e.g., Thompson-Hollands, Edson, Tompson, & Comer, 2014), 14 recent studies using a family-focused approach have been published since the last review. Categorized as probably efficacious in the 2014 update, family-focused CBT now meets the criteria for a well-established treatment as a broad category. A number of controlled trials (Freeman et al., 2014; Lewin et al., 2014; Peris & Piacentini, 2013; Peris et al., 2017) now demonstrate that family-focused treatment models outperform standard treatment and/or active controls. That said, just as in the individual CBT category, we continue to face the issue of comparing dissimilar treatments. The 14 studies in this category tested very different questions despite utilizing family-focused CBT as a common treatment format. These include the addition of DCS to family-focused treatment (L. Farrell et al., 2013; E. Storch et al., 2016), intensive forms of family-focused treatment (L. Farrell et al., 2016; Whiteside et al., 2014), family-focused treatment for young children (Freeman et al., 2014; Lewin et al., 2014), parent-only or parent-enhanced models of treatment (Lebowitz, 2013; Reynolds et al., 2013; Rosa-Alcázar et al., 2017), family-focused treatment for PANS-related OCD (Nadeau et al., 2015), and effectiveness studies (Skarphedinsson et al., 2014; Torp et al., 2015). It is possible to consider all of

these variants more broadly as "family-integrated treatments" (FITs) as described by Thompson-Hollands et al. (2014), but in addition to exposure-based CBT, they contain other important "practice elements" that are lost within the broader category. Of particular note, one might argue that the studies by Peris et al. (2017) and Peris and Piacentini (2013; described in more detail earlier) did not actually test only a "family-focused CBT" but the augmentative value of family therapy for families identified as needing this level of support. Based on their findings and rigorous designs, the combination of family-focused CBT + PFIT could be deemed *p*robably efficacious with the limiting factor being that both studies came out of the same research group.

Non-Face-to-Face/Technology CBT. Five studies have been added to this category, which was first added in the 2014 evidence base update. At that time, non-face-to-face treatment was considered possibly efficacious and included only two open trials. With the addition of these new interventions, which test Internet-delivered (Comer et al., 2016; Lenhard et al., 2017, 2014) and phone-delivered (Turner et al., 2014), non-face-to-face CBT is now considered probably efficacious.

Group CBT. Based on the 2014 review, both family-focused group CBT and non-family-focused group CBT were considered possibly efficacious treatments, as all the studies were open trials (Lara Farrell, Waters, Milliner, & Ollendick, 2012; Olino et al., 2011; Söchting & Third, 2011). In the only study of group treatment to meet criteria for the current review, Riise et al. (2016) studied concentrated exposure delivery (brief intensive treatment) in a group format. Although the results are promising, because the study was uncontrolled, family-focused group CBT and non-family-focused group CBT remain possibly efficacious treatments at this time.

Other Treatments. CBT is clearly effective for treating pediatric OCD, but there remain nonresponders to CBT, and new treatment approaches are needed. Our 2014 review highlighted the need for alternative interventions for pediatric OCD, as well as the need to find ways to enhance the efficacy of CBT for OCD. We identified two studies for this review that examined other treatment approaches, including Acceptance and Commitment Therapy (ACT; Armstrong et al., 2013) and an attachment-based intervention (Rezvan et al., 2013). Based on these results, both are considered *experimental* treatments at this time.

Summary of the Evidence

The results of this review suggest that there have been significant advancements in the evidence base for several psychosocial treatments for pediatric OCD, but there is still much work to be done (see Table 4). In contrast to the 2014 Evidence Base Update article, a number of treatment families (similar forms of CBT that share common elements; e.g., family-focused CBT) as well as some specific treatment programs (e.g., family-focused CBT for young children) have been deemed well-established as specified by the criteria used by Southam-Gerow and Prinstein (2014). As described earlier, the designation of *well-established* requires that a treatment demonstrate superiority to psychological placebo or another active treatment or equivalency to an already well-established treatment in at least two independent, methodologically rigorous randomized controlled trials. However, many aspects of this process lead to more questions than answers. Given the progress of the field beyond questions of *what works* (i.e., treatment efficacy), most new studies have focused on *improving what works* (i.e., augmentation and optimization approaches) by adding treatments or by testing variants that target specific subpopulations. Again, these important and fundamental research changes make the process of comparing across studies in order to characterize the evidence much more challenging.

New Framework: Central Research Goal

Using our new organizational structure focused on the intended goal of each study (and corresponding design), we can also apply the EBT evaluation criteria. Although there is a lot of overlap, these categories also help to organize the evidence in a slightly different way.

CBT Efficacy. Considering CBT efficacy in new populations (young children, PANS-related OCD), combined study results support that family-focused CBT is a tolerable, acceptable, and highly effective intervention for young children and could itself be considered well-established for this subgroup. Based on only one open trial, CBT specific to youth with PANS-related OCD remains an *experimental* treatment. Finally, studies tested ACT Efficacy and Attachment Focused Treatment Efficacy. Important to note, both are non-CBT approaches, though both are considered *experimental* treatments at this time.

Improving CBT. Among studies that were designed to augment or optimize CBT outcomes (i.e., by adding DCS, sertraline, CBM-I, family/parenting modules), results are mixed. As the goal of these studies was to test whether CBT could be *improved*, we evaluated augmentation/optimization strategies according to whether, when added to CBT, they were superior to CBT alone. Trials that tested CBT with DCS demonstrated that the combination was not superior to CBT alone; the same was true for a trial of CBT with sertraline. Because they include CBT, these combined treatments seem likely to benefit youth with OCD.

TABLE 4
Evidence Base Update for Pediatric Obsessive-Compulsive Disorder Treatment: Summary Table

Traditional Framework: Treatment Type and Format				
Level 1: Well-established	*Level 2: Probably Efficacious*	*Level 3: Possibly Efficacious*	*Level 4: Experimental*	*Level 5: Not Effective*
Family focused CBT	Individual CBT	Family focused group CBT	ACT	-
-	Non face-to-face CBT	Non-family focused group CBT	Attachment-based therapy	-
New Framework: Central Research Goal				
Level 1: Well-established	*Level 2: Probably Efficacious*	*Level 3: Possibly Efficacious*	*Level 4: Experimental*	*Level 5: Not Effective*
CBT for young children	Technology-based CBT delivery	Effectiveness Treatment Studies	CBT for co-occurring PANS/PANDAS	-
-	CBT + PFIT	Intensive CBT delivery	ACT	-
-	-	-	Attachment-based therapy	-
-	-	-	CBT + CBM-I	-
-	-	-	Self-help CBT studies	-
-	-	-	CBT + PT	-
-	-	-	CBT for co-occurring Externalizing Disorder	-

Note: ACT = Acceptance and Commitment Therapy; CBM-I = Cognitive Bias Modification - Interpretation; CBT = Cognitive Behavioral Therapy; DCS = D-cycloserine; ERP = Exposure and Response Prevention; PANDAS = Pediatric Autoimmune Neuropsychiatric Disorders Associated with Streptococcal Infections; PANS = Pediatric Acute-onset Neuropsychiatric Syndrome; SRT = Sertraline.

However, the evidence reviewed herein does not support their efficacy over and above CBT, and it is unclear whether or under what conditions the addition of these treatments to CBT could be indicated. We included these studies because the combination of CBT and medication augmentation is clearly important and clinically relevant (and met our criteria for study inclusion). However, because of the findings and the fact that both are medication only augmentation strategies, we have chosen not to give them evidence base–level designations at this time. At present, given the very limited data in pediatric OCD, augmentation of CBT with CBM-I in youth can be considered an *experimental* treatment. As noted already, the broad format of family-focused CBT has reached the level of a well-established treatment in this most recent update. The addition of the PFIT program to standard CBT (Peris & Piacentini, 2013; Peris et al., 2017) has sufficient evidence to receive a label of probably efficacious, limited only by both studies being conducted by the same research group. The addition of different forms of parent training to CBT, particularly when used in an identified subset of youth with co-occurring externalizing disorders, holds promise but would be considered *experimental*.

Transporting CBT. There has been some very significant work toward understanding community effectiveness of CBT over the past few years (Torp et al., 2015); however, the absence of controlled effectiveness trials contributes to a designation of possibly efficacious for CBT in community settings. There has also been progress toward understanding CBT delivery modifications (e.g., telehealth, intensive). Technology-based CBT is considered a probably efficacious treatment at this time. Similar to other areas of promising research in OCD treatment, more methodologically rigorous studies with an active comparison condition are needed for intensive treatment to move beyond the level of possibly efficacious. Given the single open trial and limited effectiveness of the intervention, CBT delivered as self-help bibliography would be considered an *experimental* treatment.

Traditional Framework: Treatment Type and Format

Individual CBT was previously designated as a probably efficacious treatment (Freeman et al., 2014) based on findings from both the POTS Team (2004) and Franklin et al. (2011). Although both studies meet Level 1 methods criteria, they were conducted by the same research groups. Although CBT as a broad treatment family has been clearly deemed effective in multiple meta-analyses and its efficacy is not found to differ by format (e.g., individual or family) in these meta-analyses, if we follow a strict interpretation of the EBT evaluation criteria, Individual CBT remains designated as probably efficacious given that the most recent additions to the individual CBT treatment literature have been asking different research questions with their designs (see earlier). Previously considered a probably efficacious treatment (Freeman et al., 2014), *family-focused CBT* now meets the criteria for a well-established treatment based on the findings from Freeman et al. (2008) and Piacentini et al. (2011; included in Freeman et al., 2014) as well as additional papers by Freeman, Sapyta, et al.

(2014), Lewin et al. (2014), Peris and Piacentini (2013), and Peris et al. (2017). Based on this review, both *family-focused group CBT* and *non-family-focused group CBT* remain possibly efficacious treatments. Family-focused group CBT was previously classified as possibly efficacious (Barrett et al., 2008) based on a study demonstrating its superiority to a waitlist control condition (Barrett, Healy-Farrell, & March, 2004). All additional trials in this category have been uncontrolled open trials (Lara Farrell et al., 2012; Riise et al., 2016) resulting in no change for its evidence-based designation. Non-family-focused group CBT was previously designated as possibly efficacious due to an absence of controlled data, and no new studies have been added since the last review. Designated a *possibly efficacious* treatment based on the promising results of Storch et al. (2011) in the last review, non-face-to-face CBT can be considered a *probably efficacious* treatment based on the work of Comer et al. (2016) and Turner et al. (2014) as well as the encouraging work of other research groups. Finally, new treatments outside of CBT included ACT and attachment focused treatment, which can both be considered *experimental* treatments at this time.

Predictors and Moderators of Treatment Response: What Works for Whom?

In the context of treatment efficacy, predictors identify characteristics associated with response to treatment, whereas moderators characterize *differential* response to one treatment versus another. In the previous evidence base update (Freeman et al., 2014), there was limited support for *demographic predictors* of CBT outcome (age, sex). Some baseline *clinical predictors* consistently related to outcomes (symptom severity, functional impairment, presence of hoarding), whereas others did so inconsistently (comorbidity, illness duration, insight, and motivation). There was strong support for baseline *family predictors* (family history of OCD, family accommodation, family conflict, parental blame, child/maternal expressed emotion). There was also emerging evidence for baseline *neurocognitive predictors* (executive functioning) and general *treatment processes* (therapeutic alliance, treatment expectancy).

The previous update also identified several *moderators* of CBT outcome, with most evidence coming from secondary studies of the POTS-I clinical trial sample (POTS Team, 2004). Among youth who had a first-degree relative with OCD, all treatment effects were attenuated, but CBT + SRI remained efficacious, whereas CBT alone did not (Garcia et al., 2010). Youth with tic disorders did not benefit from SRI monotherapy, whereas youth without tic disorders did benefit from SRI monotherapy; other treatment effects were similar across these groups (March et al., 2007). Two studies using other samples found equal benefit for CBT or combined treatment among youth with and without tics (Keeley, Storch, Merlo, & Geffken, 2008; E. Storch et al., 2008).

Current Review of Predictors and Moderators

To provide an update on our progress in understanding *for whom* CBT works, we review the findings of two recent meta-analyses (McGuire et al., 2015; Öst et al., 2016) and the most recent available literature review (Turner, O'Gorman, Nair, & O'Kearney, 2018) that examined predictors and moderators of outcome in CBT trials. We also briefly review relevant studies that were not included in either publication (because they were not yet published or did not meet inclusion criteria), as well as those that were included but examined novel constructs.

Predictors

McGuire and colleagues (2015) completed a meta-analysis that included youth receiving CBT across 10 trials. In studies that used a nonactive comparison group (waitlist, placebo, or treatment as usual), greater percentage of cooccurring anxiety disorders, greater number of treatment hours, and lower attrition were associated with larger effect sizes for CBT. In studies that used an active comparison group (e.g., relaxation therapy), only the presence of tics was associated with larger CBT effects. Ost and colleagues (2016) completed a meta-analysis that included youth receiving CBT across 25 trials; younger age, lower baseline severity, lower proportion of youth declining participation, and higher proportion of comorbid anxiety disorders predicted outcomes. In a recent literature review, Turner and colleagues (2018) identified 30 studies that tested predictors of CBT outcomes. Of these 30 studies, nine were not yet published at the time of the previous evidence base update (Brown, Lester, Jassi, Heyman, & Krebs, 2015; Højgaard et al., 2017; Ivarsson & Skarphedinsson, 2015; McNamara et al., 2014; Monzani et al., 2015; Rudy, Lewin, Geffken, Murphy, & Storch, 2014; Torp et al., 2015; Wolters et al., 2016). Significant pooled effects emerged such that better CBT outcomes were associated with younger age, lower OCD severity and impairment, absence of any comorbidity, and lower family accommodation.

Demographic Predictors

With new studies since the previous update, age has emerged as a consistent demographic predictor, such that younger children have better outcomes with CBT (Turner et al., 2018). This does not appear to be driven by illness duration. However, Ost and colleagues (2016) found that age was no longer predictive of outcomes when studies with the youngest participants (ages 3–8) were removed from analysis.

Age effects driven by these trials could relate to a developmental process (e.g., enhanced neuroplasticity), variation in treatment approaches (e.g., high family involvement in treatment for young children) or other factors, and future studies should aim to understand the processes that underlie this effect. *Clinical Predictors*. In the first study to examine sleep in the context of CBT for pediatric OCD, Ivarsson and Skarphedinsson (2015) found that parent-report of youth sleep problems predicted higher symptom severity after CBT among 269 youth in a prior community trial (Torp et al., 2015). Sleep problems also improved significantly during treatment. Results of other studies indicate that symptom severity and functional impairment remain consistent predictors of CBT outcome, yet the role of comorbidity continues to be unclear. Some findings support improved outcomes for youth with anxiety disorders (trials with nonactive comparison; McGuire et al., 2015) and for youth with tic disorders (trials with active comparison; McGuire et al., 2015), whereas some find attenuated CBT outcomes with the presence of any comorbidity (Turner et al., 2018).

Family Predictors. Among 46 young children who received CBT in the POTS Jr trial, Selles and colleagues (2018) examined child and parent ability to tolerate child distress; fathers' tolerance at baseline predicted OCD symptom improvement. Overall, there continues to be strong support across studies for baseline family predictors (family history of OCD, family accommodation, family conflict, parental blame, child/maternal expressed emotion, parent toleration of child distress).

Neurocognitive Predictors. Among 56 youth (ages 7–17) who received CBT (with placebo, slow SRI titration, or fast titration; E. Storch et al., 2013), McNamara et al. (2014) measured parent-reported EF across eight domains; better emotional control at baseline was associated with greater reduction in OCD severity during treatment. In a study that contradicts these findings, Hybel, Mortensen, Lambek, Thastum, and Thomsen (2017) studied EF among 50 youth (ages 7–17) who participated in a community treatment study (youth taking medications and with depression were excluded; Torp et al., 2015). Controlling for age, sex, and parent education, *poorer* latent task-based EF predicted *greater* symptom reduction from pre- to posttreatment. Among those with a better than average latent EF score, authors found a sevenfold increase in rate of nonresponse among those with a better-than-average latent EF score above the mean. Future work is needed to reconcile these findings and more fully understand the role of neurocognitive processes in CBT.

Neural Predictors. In a study of 44 youth who completed CBT, O'Neill et al. (2017) and colleagues examined regional glutamate in the anterior and posterior cingulate cortex. Results showed that lower baseline regional glutamate predicted response to CBT. Of interest, it was not different in youth with OCD versus a nonclinical control group, suggesting that it could relate to mechanisms of CBT but not OCD pathophysiology. In line with this idea, authors also found significant pre–posttreatment decreases in regional glutamate for youth who received CBT.

General Treatment Process. Park et al. (2014) examined homework compliance among 30 youth receiving CBT with or without DCS in a prior trial (Storch et al., 2010). Better homework compliance predicted greater symptom reduction; this was not different by treatment group. In a similar study, Olatunji et al. (2015) examined week-to-week homework compliance among 27 youth receiving CBT with or without DCS in a prior trial (Mataix-Cols et al., 2014). Greater homework compliance predicted lower CY-BOCS in the subsequent week, but analysis by treatment condition suggests that this was true only for youth receiving DCS. Among youth with high homework compliance, CBT+ DCS outperformed CBT + placebo, despite original trial results that did not support DCS efficacy. Overall, results of these and other studies support the general importance of homework compliance in CBT but mirror other conflicting findings in the DCS literature suggesting that effects are dependent on complex therapeutic processes.

Moderators

In their review, Turner et al. (2018) included five moderator studies representing samples across four trials; one of these studies is new since the last evidence base update (Skarphedinsson et al., 2014). As we reviewed earlier, this study found that when youth did not respond to initial treatment with CBT, continuing CBT was inferior to commencing sertraline for those with tics but was not different for those without tics. In a study that was not included in Turner et al. (2018), Conelea et al. (2014) examined the presence of tics as a moderator in the POTS II trial, where all youth were partial responders to SRI monotherapy; tics were not associated with a difference in outcomes for any treatment condition (SRI alone vs. SRI with instructions in CBT vs. SRI with full CBT). With the exception of Skarphedinsson et al. (2014), who included only CBT nonresponders by design, all other studies to date support the equal efficacy of CBT for youth with and without tics, and meta-analysis suggests that tics could be associated with *larger* CBT effects (McGuire et al., 2015). One study (March et al., 2007) found that SRI monotherapy was not efficacious for youth with tics; several other trials have also found attenuated SRI effects among youth with tics (Geller et al., 2003; McDougle et al., 1994). In sum, for youth with tics, evidence suggests reduced efficacy of SRI

monotherapy but supports the efficacy of CBT; among those who do not initially respond to CBT, SRI augmentation or monotherapy may be indicated.

Although evidence from predictor studies suggests that youth with severe symptoms benefit less (or less quickly) from CBT, there is no evidence that combination treatment (CBT + SRI) is superior to CBT alone for these youth (Turner et al., 2018). This has prompted many researchers (Ivarsson et al., 2015; Öst et al., 2016; Turner et al., 2018) to question the historical recommendations to start these youth with combination treatment (Geller & March, 2012). For all youth, including those with severe symptoms and/or tics, decisions about whether combined treatment is indicated continue to include considerations other than efficacy alone. These include but are not limited to patient preference, side effects, concerns about long-term safety risks, and beliefs about CBT relative to medication treatment (Ivarsson et al., 2015). As previously noted, understanding the interplay of medications and CBT remains an important focus in our field.

Summary

As a whole, this body of research suggests that demographic, clinical, and family factors are consistent predictors of CBT outcome. Thus far, there are conflicting findings for neurocognitive predictors, which may relate to different measures and methods used across studies. Future work in this area should focus on understanding the overlap of constructs tapped with each measure and may need to consider heterogeneous clinical presentation in OCD (e.g., Berlin & Lee, 2018). Emerging neural research is promising and could have future value for predicting CBT response. With advances in measurement technology and recent funding priorities, we anticipate rapid acceleration of neural research over the coming years. There may be further benefit from statistical advances such as computational modeling and machine learning, which hold promise for enabling more accurate prediction of treatment outcomes (e.g., Lenhard et al., 2018). Finally, research on general treatment processes that predict CBT outcome has been more limited than expected. However, recent work suggests that the effects of CBT for OCD are highly treatment specific and not well explained by general treatment processes (Strauss, Huppert, Simpson, & Foa, 2018).

The Next Frontier: Why and How Does Treatment Work?

We have made substantial progress toward answering the question "Which treatments work?" and some progress toward understanding *in what setting* and *for whom* they work. However, the number of CBT treatment approaches continues to increase. Exhausting all possible comparisons among them is untenable and likely to have diminishing practical value (Arch, 2018). Understanding treatment mechanisms, or *why* treatments work, is widely considered to be a next frontier for treatment research (Kazdin, 2007, 2008), is central to understanding treatment efficacy, and is now explicitly prioritized in federally funded clinical trials (Insel & Gogtay, 2014). Cognitive-behavioral theory identifies several disorder mechanisms underlying OCD, including negative reinforcement of symptoms (whereby compulsions provide relief from fear or distress caused by obsessions) and bias toward cognitive errors (overestimates of the likelihood and severity of danger in relatively safe situations; Foa & Kozak, 1986; Salkovskis, 1985). These disorder mechanisms are thought to be addressed during cognitive behavioral treatment (CBT).

This evidence base update has predominantly focused on CBT that is exposure based, for which theories of mechanism center on fear extinction learning (e.g., Jacoby & Abramowitz, 2016). Nearly all advances in this area come from translational studies, which suggest that fear extinction learning occurs in phases (extinction acquisition, consolidation, and recall) and that manipulating learning procedures or context can enhance extinction consolidation and/or recall (Vervliet, Craske, & Hermans, 2013). Although a full discussion of mechanisms is beyond the scope of this article, we note this area of work because the preceding findings have prompted researchers to suggest the use of parallel strategies during exposure in clinical treatment as one way to optimize CBT outcomes (Craske et al., 2008; e.g., Jacoby & Abramowitz, 2016). Despite this, few studies have examined fear extinction learning during clinical treatment, and even fewer among youth.

One way to move mechanistic research forward is through understanding *treatment-specific process*, or the interactions and events that uniquely comprise each ingredient in an efficacious treatment (Figure 2). Questions about treatment-specific process ask, "*How* does this treatment work?" and are distinct from but might complement questions about treatment mechanism. For example, we may wish to know which types of therapist statements (a process) lead to subsequent cognitive change (a mechanism), and whether each of these improves treatment outcomes. Studying process is a promising way to identify key elements of treatment quality, understand how these relate to mechanisms, and ultimately improve flexibility and potency in practice settings. Despite this, optimal treatment-specific process is rarely detailed in treatment manuals, is difficult to standardize and disseminate, and remains poorly understood.

To illustrate the importance of closing this gap, we review studies of CBT-specific process in pediatric OCD. To date, all such studies have focused on exposure, which has substantial empirical support as an ingredient in CBT packages (Higa-McMillan et al., 2016), yet was recently described as a "black box that needs unpacking" (Garcia, 2017). In the first

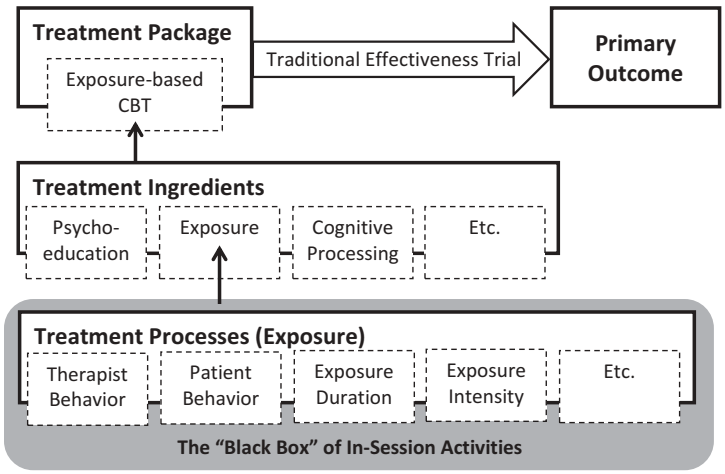

FIGURE 2 Conceptual model of the relationship between package, ingredient, and process.

of these studies, Benito and colleagues (2012) coded observed processes during videotaped exposures for 18 young children (ages 4–8) who received family-focused CBT as part of a pilot trial (Freeman et al., 2008). The most commonly observed processes included therapists encouraging approach behavior, therapists using externalizing language (e.g., giving OCD a name), and children engaging in avoidance behavior. Therapist statements were categorized according to function on fear; more fear-increasing or maintaining statements predicted improved outcomes at posttreatment and 3-month follow-up. Although small and underpowered, this study demonstrated the potential importance of exposure-specific processes for understanding variability in treatment outcomes.

Two studies examined different aspects of exposure process using youth (ages 8–17) drawn from the same RCT (Piacentini et al., 2011). In 40 of these participants, Kirckanski and Peris (2015) assessed subjective units of distress (SUDS) at the beginning of each treatment session, with SUDS ratings based on parent- and child-rated symptom distress (assessed via therapist interview of symptoms as rated on the CY-BOCS). Results showed that symptom distress generally decreased across treatment, and that the degree of reduction predicted global improvement, OCD severity, and functional impairment. However, because SUDS ratings were based on symptoms rather than in-session exposure activities, it is possible that they represent a measure of clinical change rather than of exposure process.

In the second study from this sample, Chu, Colognori, et al. (2015) observed 43 youth during 172 exposure sessions. At each session, they completed global ratings for each exposure task, including fear level, therapist behaviors (teaching cognitive strategies, encouraging exposure engagement), and youth behaviors (cognitive and behavioral coping; interference behaviors such as avoidance, escape, and compulsions). Results showed that fear significantly reduced *across* exposure tasks within sessions but did not reduce across treatment. This is in contrast to the preceding findings in this same sample (Kircanski & Peris, 2015), which could relate to differences in the role of exposure-related distress versus symptom-related distress. Chu, Colognori, and colleagues (2015) also examined temporal effects (*across* exposure tasks) and found that youth interfering behavior predicted lower fear during later exposures. Fear level predicted youth coping behavior in subsequent exposures, although the reverse temporal relationship was not found. Of interest, therapist behaviors were associated with increases in fear within an exposure task but did not predict fear changes during subsequent exposures. Although this study has notable strengths (independent observational measurement, rigorous test of direction/sequence of effects), it did not examine exposure process in relation to clinical outcomes.

In a sample of 35 youth (ages 8–17) receiving individual or family-focused treatment during a pilot RCT, Kircanski and Peris (2015) examined changes in SUDS *across* separate exposure tasks occurring within each session (as recorded by therapists postsession). At posttreatment, global improvement was predicted by a higher proportion of exposure tasks that targeted more than one OCD symptom and by lower peak distress during the last exposure task in a given session. At 3-month follow-up, global improvement was predicted by greater decrease in peak distress *across* exposure tasks (within a session), and variability in peak distress *across* exposure tasks (within a session). Between-session variability also predicted greater CY-BOCS change and improved global functioning at 3-month follow-up. This might indicate that, within a session, conducting exposure tasks in order of decreasing and/or variable difficulty is beneficial. Alternatively, it could indicate that individuals

who experience regularly or intermittently lower peak distress *despite* increasing task difficulty will go on to have better outcomes. This highlights the need to better understand relevant context and causes of exposure processes before making concrete recommendations for practice. Despite some measurement limitations (recording therapists were involved in exposure process, not blind to treatment progress, and possibly influenced by recall bias), this study importantly linked changes in exposure-related distress to clinical outcomes.

Most recently, Benito and colleagues (2018) used observational coding to examine multiple types of fear change *within* 459 videotaped exposure tasks for 111 youth who received CBT in all three POTS trials. Fear change ratings incorporated information about other concurrent exposure processes in order to parse out the effects of nonlearning processes (e.g., accommodation, rituals) on fear reduction. Results showed that fear reduction associated with these processes did not relate to outcomes, but fear reduction occurring "on its own" predicted OCD symptom reduction, global improvement, and treatment response. Other fear changes (increases, variability) did not predict any outcomes. These findings are consistent with CBT theory and further underscore the importance of understanding processes along with their context and proximal causes. Of interest, most exposure tasks in this study included multiple fear "peaks," and few were characterized by a single peak followed by gradual and linear fear decrease —features that are most consistent with contemporary theories of exposure mechanism (e.g., Craske, Treanor, Conway, Zbozinek, & Vervliet, 2014) despite these exposures occurring in the POTS trials as many as 20 years ago. This calls into question common assumptions about the processes that make up existing efficacious treatments and illustrates the potential for process research to be used in the future for complementing and accelerating laboratory-based studies of treatment mechanism.

Together, these studies demonstrate substantial variability in exposure-specific process during CBT trials for youth with OCD. Moreover, exposure process variability relates to clinical outcomes despite therapists being highly trained and adherent, and despite the presence of other potentially active treatment ingredients. However, the processes that comprise efficacious treatments remain largely inside the "black box." Although compelling translational work has prompted calls for clinical comparisons of "optimized" versus "traditional" exposure process packages (e.g., Weisman & Rodebaugh, 2018), findings from Benito et al. (2018) raise concerns about the utility of doing so when "traditional" processes remain so poorly characterized. Additional questions for exposure process research might relate to the way therapists select, conduct, order, pace, augment, or terminate exposure tasks, or how to tailor processes using individual and context factors. In addition, exposure processes seem likely to have complex relationships with outcome that may be nonlinear (e.g., more is not always better) or moderated by other concurrent processes (e.g., some processes are desirable when fear is high but not when fear is low). Future research is needed to explore this complex interaction of behavior, contextual factors, and mechanism during exposure tasks.

Exposure is only one of many important ingredients in CBT for pediatric OCD, and research has not touched on any processes central to those ingredients (see Franklin et al. [2013] for a well-organized theoretical review). However, exposure provides an example with which we illustrate the important role for process in future clinical treatment research. Process research could inform earlier translational work by identifying new ways to manipulate mechanisms in laboratory paradigms, revealing novel targets for new treatments or augmentation strategies, or understanding other changes that accompany important treatment processes (e.g., neural changes). The preceding studies demonstrate how process and mechanism can be linked; indeed, studying them together might reveal more than studying either one alone. Observing these links in existing treatments might ultimately yield a rich empirical network of therapist and patient behaviors associated with therapeutic change. With clear operational definitions, such an empirical network could form the basis of a process "tool kit" that would contribute to reproducibility and aid communication among researchers, therapists, and patients. Understanding process may hold particular value for therapist training, where approaches could move away from emphasizing step-by-step procedures in favor of a flexible approach to activating specific, underlying processes of behavior change. Effective and behaviorally anchored treatment processes could also serve as therapist training targets, potentially enhancing treatment efficiency, quality and outcomes in practice settings. Altogether, understanding process is the next critical step in the evolution of treatment research and there is a clear need for this work in pediatric OCD.

DISCUSSION

In the course of completing this update, making evaluative comparisons across different treatments was difficult due to important methodological differences across studies that were designed to answer different (and important) primary questions. Thus, we considered progress using the traditional evidence base update framework and then considered progress using an updated framework that is grounded in the central question and related design of the original studies. Using either framework, it is clear that the field of psychosocial research in pediatric OCD has made substantial forward growth since the 2014 Evidence Base Update. CBT is an efficacious intervention for children and adolescents with OCD, with broad support evident in the current review,

numerous meta analyses, and years of clinical practice. Family-focused approaches have become more common than in the past reflecting the clinical reality of treating youth. In addition to identifying multiple new *well-established* CBT treatments and many promising *probably efficacious* CBT treatments, the field has advanced in understanding not only *what treatments work* but also *for whom* they are efficacious. Building on considerable work in the area of outcome predictors and moderators, researchers are now designing novel treatments and augmentation strategies meant to target those subgroups that demonstrate inadequate response to first-line methods. Some of these "sicker" patients were underrepresented in original trials, tend to have poor access to treatment, and are most represented in higher levels of clinical care (e.g., intensive outpatient and partial hospital programs). Finally, the field is also considering how to make CBT more accessible to youth and families using creative methods of service delivery.

What Have We Addressed and Where Do We Go Next?

In the last review, there were no *well-established* treatments for pediatric OCD, leading us to call for replication studies and studies that compare active treatments. In particular, methodological factors were a significant issue, making it hard to compare studies with different control groups, outcome measures, and combinations of treatment ingredients. In this review, methodological rigor of the studies was uniformly high with regard to the use of active controls and standardized assessments, and we can now cite family-focused CBT as a well-established treatment. However, we continue to struggle with some of these comparisons and inconsistent definitions of response across the same outcome measures. In part this is due to changes in what the field sees as fundamental priorities and may also relate to available funding opportunities (Insel & Gogtay, 2014). Moving forward, we anticipate that current U.S. federal funding priorities might facilitate the comparison of active treatments under conditions of high external validity through comparative effectiveness studies (e.g., Patient Centered Outcomes Research Institute) and might facilitate identification of CBT mechanisms through experimental therapeutics designs (Insel & Gogtay, 2014), which use rigorous methods across a series of studies that are together designed to explicitly test mechanism. We have made less headway when it comes to identifying new efficacious treatments outside of CBT. Only two of 26 studies identified for this review considered a non-CBT model (ACT and attachment-based treatment, both considered *experimental* treatments).

Another notable problem in the last update was our lack of understanding about factors that contribute to inadequate CBT response (i.e., partial and nonresponse) and approaches for improving outcomes in these subsets of youth. With this review, we have noted some improvement in these areas. Of the studies selected for this review, only three included a group of patients that could be defined as treatment resistant (Farrell et al., 2013; Lebowitz, 2013; Skarphedinsson et al., 2014). However, 17 studies considered nonsymptom-level outcomes (e.g., CGI–Improvement and Severity scales, Child Obsessive Compulsive Impact Scale–Child and Parent Version, Children's Global Assessment Scale) and 17 studies included posttreatment follow-up. Notably, we continue to have very little high-quality data about multimodal intensive treatments and other service delivery models that may benefit those with severe and/or treatment-resistant OCD. Although not the explicit focus of this update, we also have far to go in terms of research on pharmacotherapy options for these youth (Öst et al., 2016). We also note that causes of treatment nonresponse are likely heterogeneous. As such, progress in this area is limited by the need for very large sample sizes to ensure power for detecting differences among nonresponder subgroups. Moving forward, we anticipate progress in this area as researchers have increasing access to large public data sets. Previous updates have called for increased CBT mechanism research (Barrett et al., 2008; Freeman et al., 2014); improved knowledge of treatment mechanisms might also further our understanding of treatment nonresponse, for example, by identifying whether the treatment mechanism is not optimally engaged for some youth.

In the last update, there was an absence of support for CBT augmentation strategies (both psychosocial and pharmacological/biological). Here, we identified considerable progress; a large number of studies (11) in the current review were designed explicitly to test the addition of a strategy to improve CBT outcomes (e.g., DCS, family therapy, parent training). Among these approaches, there was consistent support for family therapy but inconsistent and inadequate support for other strategies (e.g., DCS, sertraline, CBM-I). Overall, there is more work to be done to identify the most promising augmentation and optimization strategies. Ideally, this will include further work on targeted approaches that have a strong rationale for improving mechanism engagement, barriers to treatment response, or addressing the needs of subgroups. These targeted approaches could be automated (e.g., computerized attention retraining), psychosocial (e.g., cognitive training), neural (e.g., neuromodulation), or pharmacological (e.g., agents that enhance extinction consolidation, such as methylene blue). Of note, it may be particularly important to consider the interaction of biological and behavioral techniques. Although the DCS studies we reviewed did not find support for CBT+ DCS versus CBT alone, they also did not concurrently examine exposure processes. As other literature with adults suggests that effects of DCS may be contingent on successful exposure processes (Smits et al., 2013, 2013; Telch et al., 2014), future studies may wish to examine this in youth with OCD.

Both previous updates named the lack of sample diversity (e.g, race, income, delivery context in academic settings) as a concern, which made it impossible to draw conclusions about treatment efficacy outside of similar groups. Although some progress has been made in terms of including more diverse samples (e.g., Peris et al., 2017), the majority of samples continue to be primarily Caucasian, with relatively few studies reporting on or examining income. In regard to diagnostic diversity, the majority of studies identified comorbidity in their samples, most commonly reporting on comorbid anxiety and mood disorders, attention deficit/hyperactivity disorder, and tic disorders. Many studies continue to exclude more severe forms of psychopathology (e.g., bipolar disorder), as well as developmental disorders, such as autism spectrum disorders. Of note, Wood and colleagues (2006, 2009, 2015) found promising results in studies of CBT for youth with anxiety and comorbid autism spectrum disorder, although these studies included very few patients with OCD did not report on OCD specific outcomes.

We continue to emphasize the need to move our treatments beyond academic settings. This requires that we consider factors related to external validity, or "to whom and in what context do our best treatments generalize?" (Higa-McMillan et al., 2016, p. 97). We also recognize the need to consider "clinical utility indicators" including gender, age, ethnicity, format of treatment, frequency and duration of contact, clinical setting, treatment acceptability and to "identify ways to increase the rate, consistency, magnitude, and durability of effects; decrease nonresponse rates; consider engagement issues; and examine dynamic designs as they move into complex systems of care" (Higa-McMillan et al., 2016). This further speaks to the idea that the sickest youth with the most comorbidity and significant psychosocial challenges are unlikely to be those included in RCTs (Öst et al., 2016).

Although there has been some improvement in sample diversity, we still lack controlled evidence for effectiveness in practice settings. The NordLOTS study (Torp et al., 2015) demonstrated high response rates using a stepped treatment approach in a large effectiveness study but did not include a comparison condition. Moving forward, it will be critically important to study the effectiveness of CBT versus other approaches and/or usual care in practice settings. However, we note that it may be difficult to do so without first understanding how to minimize barriers to the use of exposure. Exposure is associated with specific practice barriers over and above those associated with evidence-based practices more generally (Whiteside, Deacon, Benito, & Stewart, 2016). These barriers likely contribute to infrequent exposure use, delivery that deviates from approaches recommended by experts, and limited sustainability (Chu, Crocco, et al., 2015; McLeod et al., 2017). Future studies need to understand methods for improving exposure use and quality before effectiveness studies might identify whether youth with OCD in community settings can benefit from exposure-based CBT. Relatedly, the last update called for an improved understanding of both therapist training approaches and specific treatment processes. These issues remain a challenge when presenting trial results, which often cannot include details (e.g., because of space limitations) about the specific methods by which therapists are trained or the manner in which treatment is delivered. This is even more problematic when CBT is used as a "catch-all" descriptor of a treatment. Although there are often common practice elements, it is hard to compare studies when we do not know exactly what is being compared. This highlights the importance of including basic treatment elements and the relative dose of those elements when describing an intervention. As a new addition, this update reviewed the available literature regarding CBT-specific process; all four available studies investigated processes specifically during exposure. As illustrated with this early work, future process research might accelerate our understanding of both treatment quality and mechanism. As well, understanding the processes present in existing efficacious approaches may be a necessary precursor to future trials testing "optimized" process approaches. In sum, we know that CBT works in many forms, but we are not sufficiently helping all youth with this treatment. To bridge this gap, we must continue testing novel treatments and targeted augmentation approaches, and we have far to go in understanding both *why* and *how* our treatments work. Carefully designed studies that test these questions are the next frontier for treatment outcome research in pediatric OCD.

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