# Evidence-Based Treatment for Pediatric Obsessive-Compulsive Disorder

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## ABSTRACT

Obsessive-compulsive disorder (OCD) is marked by incessant distressing thoughts or images (obsessions) and/or overt or covert behaviors (or mental rituals) aimed to reduce anxiety (compulsions). The disorder affects 1-2% of children and adults, with up to 80% of adults reporting symptom onset prior to the age of 18 years. Without appropriate intervention, symptoms tend to run a chronic course from childhood into adulthood. Obsessive-compulsive disorder contributes to considerable impairment across multiple domains of functioning, and as a result calls for effective and efficient treatment. To date, both psychological and pharmacological interventions have shown efficacy for pediatric OCD although there are associated advantages and disadvantages that must be considered in treatment planning. The intent of this review is to discuss the current state of literature regarding treatment for pediatric OCD, highlight efficient and cost-effective means of reducing impairment, and conclude with directions for future study.

**Author Note:** Ms. Brauer has no financial disclosures to report. Dr. Lewin receives research funding from NARSAD, the International OCD Foundation, the Joseph Drown Foundation, and the Friends of the Semel Institute. He serves as a consultant for Prophase Inc. and Otsuka Pharmaceuticals. Dr. Storch receives research support from the National Institutes of Health, Centers for Disease Control, All Children's Hospital Research Foundation, and Ortho-McNeil Janssen Pharmaceuticals. He receives royalties from Lawrence Erlbaum, Springer Publishers, and the American Psychological Association. He serves as a consultant for Prophase Inc., Otsuka Pharmaceuticals, and CroNos Inc.

Obsessive-compulsive disorder (OCD) is an impairing anxiety disorder which afflicts approximately1-2% of youth and adults worldwide (1-3). The disorder is marked by distressing and uncontrollable thoughts or images (obsessions) and/or overt (i.e., washing, ordering) or covert (i.e., praying, counting) behaviors aimed to reduce distress (compulsions). Obsessive-compulsive symptoms are chronic in nature, and when present during childhood interfere considerably with a child's psychosocial development across social, family, and academic domains (4-7). If left inadequately treated, clinically significant obsessive-compulsive symptoms are likely to persist into adulthood and cause future impairment (8). Taken together, this information demonstrates the need for appropriate treatment for children with OCD to curtail the negative developmental trajectory that distinguishes OCD from other anxiety disorders (9).

Traditionally, many clinicians have conceptualized the etiology and treatment of adult and pediatric OCD through a psychodynamic perspective, viewing the obsession and compulsions as a complex set of neuroses arising from intrapsychic conflict (10, 11). Unfortunately, treatments based on this premise are not empirically supported in reducing obsessive-compulsive symptoms and have little face validity in understanding etiological factors or symptom maintenance. Due to the prevalence and precarious nature of OCD, mental health providers have begun to move towards evidence-based intervention modalities for the treatment of OCD, including serotonin reuptake inhibitors (SRI) and cognitive behavioral therapy (CBT) (10). Notably, the limited treatment dissemination may contribute to a number of risks (e.g., medication side effects) and in missing an opportunity to intervene during a developmentally critical time period (12). Many youth with OCD are being prescribed antipsychotic or benzodiazepine medications in the absence of efficacy data. Such

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widespread prescription practices are conducted in the absence of supporting pediatric data and the possibility of significant adverse metabolic and cardiovascular effects. Indeed, youth taking an atypical antipsychotic medication had an average weight increase of 8.5kg over 10 weeks (13).Thus, lower-risk alternatives should be considered prior to prescription of such medications in children (14).Second, inadequate treatment of OCD symptoms during childhood have been associated with numerous psychosocial sequelae, such as problematic family relations, social dysfunction, and academic distress (4-7), which together disrupt normative development. Third, unresolved OCD symptoms tend to be chronic in nature, result in higher rates of reported unemployment, interpersonal conflict, sleep problems, and chronic distress and impairment in adulthood when compared to non-OCD anxiety disorders (9).Thus, early effective intervention is crucial to improving a child's quality of life and preventing future impairment. Although such treatments are available, information regarding their implementation is not widely disseminated. With these points in mind, the text that follows reviews evidence-based practice for the treatment of pediatric OCD, highlights the intricacies of tailoring treatment to address developmental needs and psychological comorbidity of children, and also discusses the future of treatment for this tenacious disorder.

## PHENOMENOLOGY OF PEDIATRIC OBSESSIVE-COMPULSIVE DISORDER

Like adults, youth with OCD experience obsessions that center upon themes of contamination, symmetry and precision, religiosity, lucky or unlucky numbers, and a marked preoccupation with inappropriate sexual or aggressive thoughts (15-17). Compulsions related to these common themes frequently present as cleaning or decontamination rituals, reassurance seeking, praying, touching or tapping, counting, behaviors that prevent the potential for a child to do harm to self or others, hoarding, or more general routinized behaviors. Although symptoms presentation in children is generally similar to that of adults, developmental differences do exist. Such differences include children endorsing more vague obsessions (particularly in younger children, 18), simplified content of obsessions (e.g., sexual or aggressive obsessions), increased reassurance-seeking and family involvement in rituals (19, 20), and more rituals focused on achieving a "just right" feeling (21, 22). Unfortunately, it appears that children and adolescents, like many adults (23), experience a significant delay between symptom onset and appropriate clinical assessment/intervention (22). This may be related to a lack of knowledge/awareness of the disorder by the parent, limited clinician expertise in OCD, and/or lack of available appropriate treatment resources, the latter two issues having been cited as particular issues in Israel (22). Without intervention, OCD is likely to run a chronic course (8), increasing risk for social, academic and overall functional impairment (4). Fortunately, available treatments yield robust effects, with less than half of those treated with psychotherapy, pharmacotherapy, or a combination of both meeting diagnostic threshold at treatment follow-up (4, 24).

## TREATMENT

*Psychopharmacology.* Serotonin reuptake inhibitors have been demonstrated to be effective for both pediatric and adult OCD (25-28). While numerous SRI medications have been examined in youth with OCD, the United States Food and Drug Administration has only given approvals for clomipramine (ages 10 up), sertraline (ages 6 and up), paroxetine (ages 6 and up), fluoxetine (ages 7 and up), and fluvoxamine (ages 8 and up). Clomipramine, sertraline, paroxetine, fluoxetine, and fluvoxamine have consistently demonstrated efficacy in attenuating OCD symptoms (26, 29-35)with case reports in children as young as 3.5 years of age (36). Clomipramine, once the first-line pharmacological treatment for OCD(37), has demonstrated superiority to placebo with statistical separation at 5-6 weeks (38). Sertraline (26, 31) and fluoxetine (30), similarly, have demonstrated superior efficacy to placebo in reducing OCD symptoms and overall impairment. In addition, sertraline appears to have enhanced effects when used in combination with CBT (26) leading to the suggestion of combined CBT and SRI therapy for the most severe cases. Paroxetine has demonstrated superior treatment response rates compared to placebo (64.9% v. 41.2%), but is unfortunately associated with mild to moderate side effects resulting in treatment discontinuation (34) and the nonlinear pharmacokinetics can complicate dosing in children. Finally, fluvoxamine (32) appears to be only marginally more efficacious in symptom reduction than placebo.

Unfortunately, treatment with pharmacotherapy alone rarely achieves standards of clinical remission (8, 14, 26, 28).In fact, Geller et al. (29) showed that although statistically superior to placebo, the overall difference in reduction between active treatment and placebo in the Children's Yale-Brown Obsessive Compulsive Scale (39)was marginal

(only 6 points on the 40 point scale). In addition to the concern that many youth will remain symptomatic following an adequate medication course, many SRIs are associated with adverse events which may lead to treatment discontinuation (31, 34, 36) and some families do not find SRI therapy an acceptable intervention (40). In addition, there are few SRI maintenance trials and – overall – there is limited information regarding durability of treatment gains once medications are discontinued in children with OCD. Results from numerous controlled trials in adults do suggest, however, that it is in the best interest of individuals treated with pharmacological interventions alone not to discontinue treatment as recurrence of symptoms is likely (41). Finally, there is concern regarding the risk of "suicidality" (suicidal thoughts and behavior) and behavioral activation in children and adolescents during treatment with antidepressants (see 42 for a comprehensive review). In sum, although pharmacotherapy presents as an efficacious and widely disseminated treatment for pediatric OCD, there are limitations including the presence of side effects (34), incomplete treatment response, potential for increased suicidality and behavioral activation (42), and recurrence of symptoms once active treatment ends (41).

*Cognitive-behavioral therapy*. Cognitive-behavioral therapy with exposure and response prevention is an empirically-supported treatment premised on classical and operant conditioning theories. In OCD, previously neutral stimuli become associated with aversive properties (i.e., anxiety, distress), which cause the individual to engage in compulsions to alleviate this distress. Compulsions, however, only temporarily reduce distress, causing the individual to repetitively engage in ritualistic behaviors. Exposure and response prevention is a central component of CBT which requires the individual to confront the anxiety-inducing thought or stimulus without engaging in compulsions. Distress associated with the stimulus eventually habituates over time with repeated exposures without ritual engagement (43).

Pragmatically, CBT for OCD is a multi-component treatment conducted in a sequential manner. First, an individual is provided with psychoeducation regarding the nature of OCD, including the neurobiological, cognitive, and behavioral underpinnings, and the typical treatment course. Second, a rank-ordered hierarchy is created delineating the degree of distress exposure to anxiety-inducing stimuli without ritual engagement would elicit. Treatment begins with exposure to lower-anxiety stimuli together with refraining from ritual engagement, and gradually progresses to exposure to more anxiety-provoking stimuli. As previously described, the exposure involves having the individual confront the feared situation or focus on the anxiety-inducing thought, without engaging in compulsive behaviors. Individuals remain focused or engaged in the feared situation until habituation (i.e., reduction in anxiety to negligible levels) occurs. A single exposure is typically repeated until it no longer produces significant distress. Following successful completion of an exposure (or situation on the hierarchy), treatment progresses to more difficult exposures in a gradual manner through the hierarchy (44).

Based on available empirical data and consideration of the risk/benefit profile of SRI therapy, practice guidelines recommend CBT as the first line treatment for children and adolescents with mild to moderate obsessive-compulsive symptom severity. For those youngsters with more severe symptoms, practice parameters recommend CBT in conjunction with a trial of an SRI (38).

From an outcome standpoint, CBT has consistently shown impressive results in youth with OCD in both efficacy (i.e., controlled clinical trials) (45, 46) and effectiveness research (i.e., analysis of CBT approaches outside of clinical trials) (47, 48). Two separate meta-analyses of randomized-controlled trials comparing the efficacy of CBT to pharmacotherapy and/or control conditions indicated superiority of CBT to pharmacotherapy and control comparisons in reducing obsessive-compulsive symptom severity in youth (25, 49). A large multi-site study compared the efficacy of CBT alone, sertraline alone, CBT and sertraline combined, and pill placebo in the reduction of obsessive-compulsive symptom severity in youth with OCD. Although results suggest that combined treatment was superior to CBT alone, this difference was not statistically significant on some outcomes (e.g., remission). In addition, CBT alone showed a significantly larger treatment effect (overall effect $d$ = .97; site effect $d$ = .51-1.6) than sertraline alone (overall effect $d$ = .67; site effect $d$ = .53-.80). However, it is relevant to note that a site effect in terms of CBT efficacy was observed with one site performing significantly better than another ($d$= 1.6 versus .51) suggesting caution when interpreting study results.

In addition to these robust empirical findings, effectiveness of CBT outside of the research setting has been well-demonstrated. For example, two open trials of CBT suggest 79-80% response rates (and 45-54% symptom reduction) (47, 48). Similarly, a Norwegian outpatient clinic implementing a combination of individual and family-based CBT demonstrated a large treatment effect ($d$= 3.49), with youth experiencing an average of 60.6%

reduction in symptom severity over the course of 12 sessions (51). These data corroborate the author's clinical experiences at three specialty programs for cognitive-behavioral treatment of pediatric OCD.

Rates of remission following CBT range from 40-85% (46), and have been maintained up to 7 years following treatment (45, 46). Although the utility of maintenance therapy has not been empirically evaluated, clinical experience suggests that some children will experience symptom relapse. Accordingly, booster sessions may be one method of reducing relapse and maintaining treatment gains.

## ENHANCING TREATMENT OUTCOMES

Despite their efficacy (25, 49), a significant portion of children with OCD do not respond to pharmacotherapy (~50%;(51)) or CBT (30%) (5, 26) and partial response is common. Effects are likely to be enhanced when treatments are tailored to:1) fit the developmental needs of the child, 2) address the manner in which the family system may contribute to obsessive-compulsive symptoms, and 3) address comorbid conditions that may interfere with treatment (52). Next, we discuss the manner in which various treatment strategies have been developed to address these issues.

*Family-based CBT.* Many children lack the insight into the irrationality of their obsessions either due to their cognitive development level or as a function of the disorder (53-55). This lack of insight likely reduces motivation to engage in therapeutic tasks, attenuating treatment response (56, 57). In order to address this lack of insight and motivation, families are often included in the treatment of youth with OCD for multiple reasons. First, parents can help the child to generalize skills developed in session in real world settings. Second, a child's parents can increase a child's awareness of his/her OCD symptoms. Third, parents can help to motivate that child through contingencies to enhance the child's effort to confront symptoms adaptively. Lastly, by involving a family in treatment for youth with OCD, the manner in which the family system maintains a child's symptoms can be addressed (58).

Empirical trials of family-based CBT for youth with OCD have demonstrated its superiority to relaxation training (56) and waitlist control. Group or individual formats have been associated with significant remission rates and maintenance of treatment gains at an 18-month follow-up (45). Similarly, intensive (daily for 3 weeks) and weekly (once per week for 14 weeks) family-based CBT have also revealed significant rates of remission; 75% of intensive and 50% of weekly participants achieved remission, and were able to maintain gains at a 3-month follow-up (57). Finally, it has been suggested as an efficacious treatment for youth who only partially-responded to trials of pharmacological interventions (47). As a result, family-based CBT presents as an effective intervention for youth with OCD which can be implemented in an efficient (group or intensive formats) manner.

*Comorbidity*. Similar to adults, approximately 75% of youth with OCD experience a comorbid psychiatric condition, with comorbid anxiety, depressive, and externalizing disorders among the most prevalent (27, 59-61). As the number of comorbid conditions increases, not only does response to CBT or SRI medication tend to decrease, but risk of relapse increases (27, 61). Disruptive behavior disorders (DBD) and Tourette Syndrome are disorders frequently diagnosed in children with OCD, and as a result their impact on OCD treatment has been widely examined.

Disruptive behavior disorders, such as oppositional defiant disorder and conduct disorder are among the most common comorbid disorders associated with pediatric OCD (62). Obsessive-compulsive disorder with a comorbid DBD is associated with greater OCD symptom severity and impairment, as well as greater overall anxiety and internalizing problems than those without a DBD (63). The presence of DBDs has been found to attenuate response to pharmacological (27) and psychosocial interventions (61). Anecdotally, the presence of rage or aggressive behaviors has been noted among youth with OCD. Unfortunately, "rage attacks" among youth with OCD are poorly studied. A recent study suggests that youth with OCD who present with rage attacks versus those without have increased OCD symptom severity and are more likely to report sexual, religious and aggressive obsessions and increased checking rituals (64). The presence of OCD may predispose some youth to have rage attacks, perhaps due to exposure to obsessional triggers or limited family accommodation of symptoms (19, 64). For these cases, parent-training approaches which introduce contingencies for non-compliance with therapeutic or parental commands have shown to reduce OCD-related impairment in youth (19, 46, 57).

Tics are common among youth with pediatric onset OCD (69, 70), with approximately 16% of children and adolescents with OCD exhibiting tics at some point (26, 27, 67). Similarly, 50% of children with Tourette Syndrome/Chronic Tic Disorder (TS/CTD) meet diagnostic criteria for OCD at some point during their development (68).

Given this significant overlap, OCD may have a different clinical presentation when TS/CTD is also present particularly in the presence of motoric compulsions and tics, complicating differential diagnosis (69). Some clinicians suggest that examining the relationship between the behavior and purpose (e.g., non-specific or anxiety-relieving) aids in this distinction. The presence of comorbid tics may attenuate pharmacological treatment response in pediatric OCD (67), but not CBT (67, 70). Notably, albeit a preliminary study, the presence of a tic disorder did not predispose youth with OCD to greater risk of rage attacks (64). Having a comorbid diagnosis of major depressive disorder (MDD) may attenuate treatment response as it may affect habituation to exposures (60, 71). For such cases, sequential treatment of MDD prior to OCD through the use of CBT or SRIs may enhance the effects of CBT for OCD. Attention-deficit hyperactivity disorder has also been found to attenuate CBT response, as this condition may interfere with a child's ability to focus on therapeutic strategies, and execute exposures independently (59, 72). Comorbid anxiety disorders have no impact on treatment response in OCD (67, 73).

Overall, comorbidity is a common feature in pediatric OCD, affecting up to 75% of children which may affect treatment outcome if not properly considered and addressed within the treatment plan (27, 59-61). In addition to the psychosocial intervention strategies previously mentioned, there are pharmacological strategies to address comorbidities associated with pediatric OCD. As this is beyond the scope of the current review, however, we direct the reader to the following articles for more information on this topic (22, 27, 51, 74).

*Flexible treatment modalities*. Unfortunately, access to evidence-based psychotherapy for OCD is limited (75, 76), particularly for youth. In general, the dissemination of CBT for pediatric OCD is particularly problematic in Israel in that programs continue to train clinicians in psychodynamic approaches, rather than CBT, resulting in a shortage of available clinicians (76). In addition, there are many nuances involved in tailoring the treatment to match the clinical characteristics of the affected child. This predicament may be particularly relevant in Israel, as CBT has only recently begun to be recognized as an effective treatment for OCD (10, 77).As a result of limited training and treatment dissemination, many clinicians may rely on pharmacotherapy alone or with non-evidence-based psychotherapy given its accessibility.

Since treatment with pharmacotherapy does not have the same access issues as in psychotherapy (i.e., locating a CBT provider), a recent study in the United States examined the additive effects of CBT to ongoing pharmacotherapy (78). The study examined three modes of treatment: CBT provided by trained psychologists in conjunction with continued SRI treatment; a diluted from of CBT (encouraged the use of CBT strategies rather than implementing strategies in session) conducted by the prescribing psychiatrist with ongoing SRI treatment; and SRI treatment alone. Although results have yet to be published, this design highlights the potential of CBT dissemination through psychiatrists in a manner that decreases both time and financial burden on the family.

*Intensive treatment*. Intensive treatment serves as a treatment option which not only benefits more severe cases in which symptoms are pervasive and impairing, or when insight and motivation are low, but is also an option when typical treatment formats are not available (i.e., geographical barriers) (2, 79). Cognitive-behavioral therapy is quite flexible in terms of the frequency in which sessions are held. In standard CBT for OCD, 60-minute sessions are held once per week for 13-20 weeks (38). Intensive CBT, however, consists of sessions 3-5 times per week for typically 3-5 weeks. Numerous studies have demonstrated the efficacy of intensive CBT for children with OCD (47, 57, 80, 81).

## FUTURE DIRECTIONS

*D-Cycloserine*. Research on the neural circuitry underlying fear extinction has led to the examination of d-cycloserine (DCS), a partial agonist at the NMDA receptor in the amygdala, as a method of enhancing CBT outcome. Among adult OCD, preliminary results have supported the use of DCS to augment exposure therapy (e.g., 82, 83). Storch and colleagues (84) recently examined the impact of DCS administration in conjunction with weekly CBT compared to placebo augmentation in youth with OCD. Compared to the CBT+Placebo group, youth in the CBT+DCS arm showed small-to-moderate treatment effects ($d$=.31 to .47 on primary outcomes). DCS was safe and well tolerated.

*Treatment augmentation*. Unfortunately, many youth suffer from treatment resistant OCD. Treatment resistant OCD is defined as failing adequate trials of either CBT (which is typically defined as a minimum of 12 sessions of CBT, including psychoeducation, exposure and response prevention, and discussions of relapse prevention), or failure to respond to two different SRIs (a trial of an adequate dose for at least 10 weeks, depending on

the medication) (85). For this subgroup of youth with OCD, use of an atypical antipsychotic has been used in an off-label fashion to augment SRI monotherapy (86, 87). Other medication augmentation strategies such as benzodiazepines and mood stabilizers have been used in an off-label manner but do not have empirical support in pediatric OCD (85). Psychotherapeutic strategies, such as tailoring treatments to address psychological comorbidity (as previously described), sequential treatment of comorbid disorders prior to OCD treatment, intensive treatment schedules, and home-based psychotherapies have also been suggested as means of augmenting treatment for treatment resistant pediatric OCD but also require empirical evaluation (85).

*Telehealth.* As discussed, CBT is a flexible treatment modality which can be tailored to address individual needs. A way in which this flexibility has been demonstrated and enhanced is its implementation via teletherapy. Teletherapy is a treatment conducted via webcam (either on a computer, tablet, or smartphone) in real time, in the contexts in which the symptoms occur. Theory suggests that treatment effects may be enhanced if treatment occurs in the same environment as the obsessional triggers. For many children, these triggers are present in less sterile environments than the clinic, such as at school or at home. Storch et al. (88) examined the efficacy of teletherapy for children and adolescents with OCD compared to 4-week waitlist control. Sessions were held for 60 minutes twice a week for 2 weeks, then weekly over the course of 10 weeks. A significant reduction in OCD symptoms was found at termination (56.1%), and gains were maintained over a 3-month follow-up. Although this mode of treatment may have limitations in regard to the types of exposures which can be conducted and negative impact on the therapeutic alliance, limitations may be balanced by the generalizability of skills from session to home, and the increased access to gold-standard treatment.

## CONCLUSION

Obsessive-compulsive disorder is associated with significant impairment in childhood which extends into adulthood without adequate treatment. Due to the critical nature of pediatric OCD, appropriate and timely intervention is necessary. Research to date has highlighted the intricacies of treating youth with OCD, and in response has developed effective and efficient modes of intervention. Pharmacological interventions demonstrate adequate results in reducing symptom impairment (25-28),yet it is unclear if these gains remain once active treatment is discontinued (41). Similarly, alternative theoretical interventions have yet to demonstrate efficacy in randomized controlled trials. Cognitive-behavioral therapy, however, poses as an optimal treatment option as it has demonstrated robust effects in time-limited settings (25, 38, 49), and maintenance of gains following treatment discontinuation (45, 46). Further, innovative treatments (e.g., DCS, telehealth) not only help to enhance CBT efficacy, but also aid in the dissemination of the gold-standard treatment for youth with OCD (82, 84, 88). It is with great hope that the current review highlights evidence-based interventions for treating pediatric OCD to further disseminate information and improve child quality of life.

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