

Cognitive-Behavioral Therapy for Youth with Obsessive-Compulsive and Related Disorders

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Abstract: The present article examines the prevalence of obsessive-compulsive and related disorders (OCRD) in the DSM-5 in children and adolescents as well as associated functional impairments. Traditional cognitive-behavioral treatments for OCRD disorders are discussed as well as novel treatments incorporating other forms of therapy, intensive therapy, home-based therapy, medication enhanced therapy, and technology driven therapy. Clinical implications are also discussed.

Keywords: cognitive-behavioral therapy, compulsive, novel, obsessive, pediatric, prevalence, related, spectrum, treatment.

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INTRODUCTION

With the publication of the fifth edition of the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (DSM-5) [1], a number of disorders that were previously viewed as disparate diagnoses are now grouped together with similar disorders. Thus obsessive-compulsive disorder (with or without tic disorder), body dysmorphic disorder, hoarding disorder, trichotillomania, and excoriation disorder are now bundled under the new category of Obsessive-Compulsive and Related Disorders (OCRD).

Although several of these disorders (specifically hoarding, trichotillomania, and excoriation) have been chronically under studied, there have been strong advances in our understanding of effective psychosocial treatments for those plagued by these problems. The present article seeks to review the OCRD as they present in pediatric populations, followed by a discussion of the most evidence-based psychological treatment: traditional Cognitive Behavioral Therapy (CBT). This will be followed by a review of novel and innovative approaches to CBT, based on both the research literature and clinical experience.

Defining and Understanding the Obsessive-Compulsive & Related Disorders

As mentioned above, there are currently five primary diagnoses in the OCRD category: obsessive-compulsive disorder (OCD), body dysmorphic disorder (BDD), hoarding disorder, trichotillomania (hair pulling; TTM), and excoriation (skin picking). The decision to combine these disorders under one categorical umbrella, however, was not without controversy. Opponents to this decision have argued that OCD is better suited for inclusion with other anxiety

disorders and that while all of these disorders feature similar repetitive behaviors, said behaviors serve different functions. For example, hoarding disorder is not accompanied by feelings of distress upon acquisition of items (that is to say, negative affect does not drive this behavior); instead this negative state occurs in the context of discarding items. Similarly, TTM and chronic skin-picking have been argued by some to occur as a means to maintain pleasurable feelings, though subsequent research mentioned here suggests that negative affective states may also serve to maintain this behavior.

In the opposite camp, proponents of the new OCRD category assert that while these disorders may appear topographically different, most are indeed characterized by feelings of distress or anxiety and corresponding behaviors that occur in an attempt to reduce or mediate this discomfort. These feelings of anxiety may be learned over time, but the subsequent relief experienced by performing the overt behaviors provides reinforcement for these actions thus maintaining the cycle. Each diagnosis within the OCRD categorization is then viewed through the lens of varying degrees of distressing thoughts/obsessions and/or the manifestation of a behavior aimed at reducing the distress caused by these thoughts, with perhaps an exception for hoarding disorder, though the nature of the thoughts and the behaviors vary widely. In this vein, and for the purpose of this review, it may be understood that all of the OCRD are marked by significant personal distress as the result of the thought content/recurrence and/or the repetitive behaviors as well as significant impairment in various areas of important daily functioning.

Obsessive-Compulsive Disorder

Individuals diagnosed with OCD present with obsessions and/or compulsions which are distressing and time consuming (taking more than 1 hour per day) and obsessions which are characterized by recurrent, intrusive, and unwanted images, thoughts, or urges that cause significant distress to the individual [1]. The most common obsessions

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seen in OCD concern fear of physical contamination of the body, religious obsessions (e.g., high levels of concern about offending God or concern regarding moral right and wrong), superstitions, fear of causing harm or losing control, and unwanted sexual thoughts [2]. Conversely, compulsions are repetitive and recurrent behaviors (which can be overt or covert) that occur in an attempt to prevent or alleviate the anxiety and distress caused by the obsessions. Common compulsions amongst individuals with OCD include checking behaviors, repeating behaviors, actions or movements, excessive washing/cleaning, excessive ordering or arranging, hoarding as the result of obsessions (not to be confused with hoarding disorder) and the performance of mental compulsions (eg., replacing bad thoughts with good ones, using counting as a form of distraction) [2]. While hoarding disorder has recently been recognized as a standalone diagnosis it is important to note that hoarding behavior can also appear with a diagnosis of OCD. In this instance, the hoarding of objects occurs as a result of distressing obsessions (e.g., fear of harming others), which is not the primary cause for such behavior with a diagnosis of hoarding disorder [1]. Additionally, hoarding behavior as exhibited in patients with OCD need not meet additional criteria required for a diagnosis of hoarding disorder (e.g., cluttered living space) [1].

OCD presentation is generally similar in both children and adults [3], though the nature of obsessions may differ depending the child's age and developmental level. Individuals may or may not also experience tic-related OCD, which is characterized by higher rates of tapping, touching and rubbing rituals [4]. It should be emphasized that many children may engage in some of these behaviors periodically and doing so is not necessarily considered abnormal. It is also important to note that those in the pediatric population, especially younger children, may be unable to verbalize to others the source of their symptoms, particularly the obsessions that give rise to compulsions. In other words, the child may be experiencing significant obsessions internally but may not be able to outwardly express these thoughts to others or even understand themselves the cause and effect relationship between the unwanted thoughts and their corresponding patterns of behavior.

OCD is most often viewed as heterogeneous in nature; while the overall structure of symptomology is similar across individuals, individual features do emerge and the overall course of the disorder can be significantly varied [5]. Diagnostic level OCD symptoms have been found to occur in up to 1 in 100 children and adolescents, with global population lifetime prevalence rates of 2.0% to 2.5% [6, 7]. Individuals with OCD most commonly experience onset as youth, with as many as 80% of adults with OCD experiencing onset prior to the age of 18 [8, 9]. Systematic review of the literature has supported these findings and also provided evidence for differentiation between early onset OCD (mean age onset of 11 years) and late onset OCD (mean age onset of 23 years) [10]. Researchers found that 76% of OCD cases in their meta-analysis could be classified as early onset. Evidence also suggested that early onset OCD is more common in males and associated with a greater number of overall symptoms and increased symptom severity. Though OCD can occur in younger children, it

seems to be less common in prepubescent individuals [11], with more males than females diagnosed in pediatric populations [12].

Research has shown that children suffering from OCD often experience high levels of impairment in multiple areas, such as academic functioning, emotional adjustment, daily routines, and relationships with peers and family [13-16], with the most substantial and profound impairments occurring within the home [17]. Similarly, a child's overall quality of life, that is their perception of the impact of the illness and its effects on their functioning across a variety of domains, has also been shown to greatly suffer when compared to healthy controls [18]. If left untreated these individuals may experience additional problems through adulthood, including significant deficits in the areas of interpersonal interaction and employment, resulting in overall deterioration in quality of life [2]. Often described as chronic, OCD has been postulated by many to cause longstanding and debilitating problems throughout the lifespan [19-22]. Lifetime rates of comorbidity with depression have been estimated to be as high as 80%, with lifetime rates of comorbid anxiety and tic disorders as high as 70% and 60% respectively [23-26]. Obviously, having OCD can take a massive toll on a child's life, and that of his or her family.

Hoarding Disorder

Hoarding disorder as a formal diagnosis was only added to the DSM-5; it was previously only considered a symptom of OCD or obsessive compulsive personality disorder (OCPD). This lack of a unique diagnosis often caused confusion for clinicians who witnessed this behavior in the absence of other required diagnostic criteria for either of those disorders. Hoarding behaviors were long thought to occur primarily in the adult population as only one of many symptoms of OCD or OCPD. As result of this assumption, and the fact that this diagnostic label is new to the DSM-5, there is much to be discovered about the how these behaviors may manifest themselves in children and adolescents.

Marked by persistent difficulty in discarding or parting with possessions, hoarding causes significant distress and impairment to both individuals and their family. Those experiencing significant hoarding problems will retain items regardless of their actual value as the result of distress associated with a perceived need to save them resulting in an accumulation of items that clutter living space [1]. In this light, hoarding behavior may be viewed as a compulsion, and may be defined as "pathological or excessive collecting behavior in humans" [27]. Thus, the core phenomenology of hoarding disorder can be conceptualized as involving three components: excessive collecting of items, an inability to organize said items, and an inability to discard them [28]. It is important to note that in other OCD that obsessions are typically unwanted and intrusive thoughts, with the person experiencing them trying to make them go away *via* manifested compulsions. Individuals diagnosed with hoarding disorder experience these obsessions differently, as they are typically not unwanted and are instead viewed by the individual as completely normal cognitions [29-31]. The hoarding behavior itself is not an attempt to relieve any distress, because the thoughts themselves are not viewed as distressing or upsetting. In this way, hoarding disorder may

be viewed as much more passive in nature than other OCD as distress is caused only by the prospect of having to discard one's items, not by the process of wanting to obtain them [27]. For this reason, hoarding disorder may be the most distinct disorder within the OCD category, due to an apparent total lack of insight regarding the individual's own symptomatology, a characteristic not as common in other OCD. Items collected tend to vary, but common items collected by children include toys, broken family possessions, school related items, and food [32].

The prevalence of clinical hoarding behavior in the general population has been estimated to be around 4% [33], but little is known about prevalence rates among individuals under the age of 18. Hoarding disorder prevalence has been estimated at approximately 2% within the adolescent population (with a higher prevalence in teenage girls), with the rates increasing to 3.7% if criteria of a cluttered living space is excluded, since this population has little control over their living environment [34]. Interestingly, recent research utilizing a geriatric population was able to shed light on hoarding behavior in children. Utilizing a method of decade review, researchers found that the majority of their participants began exhibiting hoarding behavior during their childhood (as young as age four) or during adolescence, with the condition consistently worsening over their life span [35]. Other research with similar findings show that mild symptoms appear to develop in the early teen years, with individuals not realizing that these behaviors may be problematic until many years later [36]. Because of this, clinical hoarding often does not receive attention until patients are later in life [37-39]. Despite this, hoarding should most likely be viewed as a chronically worsening illness that begins quite early and continues across the lifespan [36, 40].

Limited research has shown that common comorbid disorders may include major depression, dysthymia, OCD and post-traumatic stress disorder [35]. Hoarding also commonly occurs in individuals with a genetic disorder known as Prader-Willi Syndrome [32]. Hoarding may be difficult to diagnose in children and adolescents as they are rarely in control of their own living spaces, the clutter may be confined to only one room of the house (eg., their bedroom) and they may have limited access to resources needed to obtain items [32]. Efforts by caregivers to "unclutter" living space may prevent the disorder from coming to light at an earlier age, or it may be attributed to symptomatology of OCD. Research showing that the disorder most often first presents in a mild form in the pediatric population and does not worsen significantly for a period of years makes accurate diagnosis amongst children and teens difficult but also important.

Body Dysmorphic Disorder

BDD, like the other OCDs, can be viewed as a preoccupation with distressing thoughts which give rise to repetitive behaviors. However, these thoughts and behaviors are primarily directed at the physical self. According to the DSM-5 [1], those presenting with BDD experience preoccupation with one or more perceived flaws or deficits in their physical appearance (which are not observable by

others or the result of concern regarding body fat) which causes significant distress and impairment in areas of daily functioning. The individual may ruminate on perceived flaws in their overall level of attractiveness or may focus their attention on more specific body areas or qualities. These individuals at some point also perform repetitive behaviors in the form of grooming, mirror checking, or skin picking, as well as recurrent and repetitive mental acts of comparing one's physical appearance to those around them. In young children, the disorder may also present with avoidance of school and suicidality [41]. Many of the symptoms of BDD as noted above overlap with those of OCD, adding further complexity to understanding and treating those with such problems.

Due to a lack of research incorporating epidemiological surveys, the prevalence of BDD is not fully understood though it is thought to be fairly common [42]. Some estimate that prevalence rates in the general population may range from .7% to 1.7% [43-44]. It is likely seen at similar rates in adolescents, with one study finding a mean age of onset of 16 years and 70% of individuals reporting symptoms occurring prior to the age of 18 [45-46]. Some research suggests that among clinical populations of adolescents, prevalence rates may be as high as 14.3% [47]. Though onset typically occurs during adolescence, individuals are typically not diagnosed by mental health practitioners until 10 to 15 years later [48, 49]. Recent research by Mayville, Katz, Gipson and Cabral [50] examining adolescents has shown that the disorder is more common in females than males, with African Americans of both genders expressing less dissatisfaction with their bodies than Caucasians, Asians, and Hispanics. Depression is the most commonly associated comorbid diagnosis with BDD [1], and one study has shown rates of suicidal ideation among BDD adolescent populations to be as high as 80% with attempted suicide rates as high as 44% [51]. Individuals often experience impaired social and academic functioning, including social withdrawal [52] and difficulty remaining in school [41].

Trichotillomania and Excoriation

In what may appear to be a stark contrast to the concerns of those suffering from BDD, TTM (also commonly referred to as hair-pulling disorder) is marked by the recurrent pulling out of one's own hair, leading to hair loss, significant distress and impairment, despite repeated attempts and a desire to decrease or stop the behavior. Hair may be removed from any area of the body, with the most common site being the scalp, although target sites may vary with time. The behavior may occur briefly and sporadically over a period of time or occur in large sustained episodes that may continue for a period of hours [1]. Similarly, excoriation (or skin-picking disorder) is characterized by recurrent skin picking that results in dermal lesions, subsequently causes significant distress and functional impairment. These individuals present with this symptomatology despite repeated efforts and a desire to decrease or stop the behavior completely [1]. These disorders are often characterized as body-focused repetitive behaviors (BFRBs), given that the individual is engaging in focused behaviors which target one or more body regions. Studies have shown that individuals who engage in these behaviors at the clinical level experience psychological

distress in the form of depression, anxiety and low self-esteem, social impairment and physiological issues including infection related to hair pulling/skin picking [53-57].

Lifetime prevalence rates in the adult population for TTM range from estimates of 0.6-3.4%, with a prevalence rate among children and young adolescents of 1% [58] and a prevalence rate for older adolescents and young adults from 1-3.5% [59-61]. Distribution by gender has been observed as being fairly equal below the age of 5, but prevalence rates appear to increase among females with age [62]. Average onset is approximately 13 years of age, with later onset indicating an increased likelihood for the hair pulling becoming chronic, as well as increased rates in hair pulling from multiple sites and increased risk of developing comorbid disorders [58, 63-66]. While one individual may pull hair from multiple sites, or change sites with time, scalp pulling is greater among young children and eyelash pulling is more common amongst adolescents [67]. Individuals with early onset TTM (prior to age 6) typically engage in hair pulling behavior over a period of weeks to months with severity that is typically mild [68, 69]. Some pediatric patients report a feeling of tension accompanying the urge to pull hair, immediately followed by a sense of relief after pulling. This tension/relief cycle however has been found to vary greatly, and has been exhibited in anywhere from 10% to 73% of participants [60, 70, 71]. Other findings suggest that the majority of youth do not report experiencing this tension-relief cycle that appears to be more prevalent in adult patients [70, 72].

The amount of literature discussing comorbidity within this population is quite limited, however it is suggested that anxiety and depressive disorders are present in 36-70% of the pediatric population, with disruptive behavior disorders present in 24-47% [60, 70, 71]. Work by Hollander [73] demonstrated low rates of comorbid tic disorders within the pediatric population (9-13%) and even lower levels of comorbid OCD (0-13%). Additionally, Lewin and colleagues [74] showed that 45% of the children within the research sample reported symptoms of depression, and 40% reported symptoms of anxiety – both one standard deviation above what is expected in community norms. Even more noteworthy is that of this sample, 25% of the children with depressive symptoms and 20% of the children with anxiety symptoms reported symptomology above two standard deviations, highlighting the severity of comorbid issues. The study also revealed that children who developed the symptoms at an older age, during adolescence, reported depressive symptoms at a higher rate than younger children. As such, development of trichotillomania during adolescence can be particularly “devastating” as depression may serve as a mediating factor for relationships between TTM and functional impairment [74]. There is little documentation regarding functional impairment within this population, though hair pulling behavior has been shown to elicit negative evaluations by peers [75]. If left untreated however, children and adolescents who continue this behavior into adulthood may suffer from impairment in the areas of social functioning, functioning in the work place, negative affect, impaired ability to engage in recreational activities, and physical illnesses and symptoms associated with hair pulling [76, 77].

Until the publication of the DSM-5, excoriation (skin-picking) disorder was categorized as an Impulse Control Disorder. Currently, the majority of research regarding this disorder focuses on adult populations as the result of limited availability of reliable and valid measures needed to assess this behavior in children, which may in turn result in under diagnosis and difficulty recognizing the symptoms [78]. Further complicating the issue is the tendency for children and adolescents to remain secretive concerning behaviors that may be viewed as embarrassing or undesirable, thus requiring assessments that are able to gather information from multiple sources [79]. The best data available suggests that skin-picking occurs in anywhere from 10% to 40% of children [80], although diagnostic level symptoms are undoubtedly much lower. Mean age of onset appears to be around 12 years of age [81], with adults who engage in compulsive skin picking retrospectively reporting that the behavior began as early as age 10 [82]. Others, though, have suggested it often occurs at an even younger age [83, 84]. Adults who experienced childhood onset report lower levels of awareness of the behavior than individuals with later onset and are less likely to seek treatment [84].

Cognitive-Behavior Therapy for OCRD

OCRD are typically viewed as invasive, chronic, and having substantial negative impacts on the lives of those who experience them. As reviewed above, the problems grouped under the OCRD category share common, and sometimes even overlapping, symptomology. Additionally, these disorders also show similarities in the subjective experience of the individual, as well as comorbidity, neurological factors, family history and treatment response [85, 86]. As a whole, symptoms of these disorders tend to surface early in life and may become more pervasive over time if left untreated allowing for the disorder to continue through most of the lifespan. As such, early and effective intervention has the potential to bring massive benefits to youth with these problems, as well as their family and society as a whole.

Cognitive-Behavioral Therapy (CBT) is one of the most extensively researched and empirically validated forms of psychotherapy with over 500 outcome studies demonstrating treatment efficacy for a myriad of disorders, including those in the OCRD category [87]. As a treatment modality, CBT tends to be short in duration, present oriented, client focused, structured, and characterized by psycho-education and a collaborative partnership between client and practitioner. As developed over the past 50 years, CBT focuses on the modification of dysfunctional, troublesome, and unhelpful thoughts and behaviors, which can then subsequently alleviate negative affect. In this vein, dysfunctional thinking is believed to occur in all forms of mental illness and contributes to unhelpful behaviors which often provide relief from these troublesome thoughts or feelings but then ultimately serve to maintain the cycle. CBT's foundation is in the understanding that thoughts, emotions, and behaviors all interact and impact one another. By improving one or more of these areas, all are ultimately improved.

Unfortunately, many of the disorders included under the OCRD grouping umbrella are understudied when it comes to treatment outcome in youth. Reasons for this are likely

varied but include that the OCD spectrum is a relatively new conceptualization, that many of the disorders were once thought to occur primarily in adult populations, that there are significant levels of symptom overlap, and the lack of accurate assessment tools for use with pediatric populations that allows for greater instances of misdiagnosis. Other disorders, such as TTM, excoriation, and hoarding, are even more difficult to diagnose (and subsequently treat) in this population because the behaviors are often concealed by the individuals and overlooked or mediated by caregivers. Of the research available, the majority centers around behavioral approaches incorporating exposure and response prevention (EX/RP) and habit reversal training (HRT), with the more cognitively focused aspects of CBT sometimes getting overlooked. Due to high comorbidity with depression and anxiety and the fact that many OCD include a cognitive component underlying behavior, current treatments may not adequately address the needs of diagnosed individuals as they primarily seek to achieve extinction of the problem behavior rather than its potential underlying cognitive foundation. While research regarding more comprehensive approaches to treatment utilizing traditional CBT methods for many of these disorders is still in its infancy, available studies have shown promising results, as reviewed below.

CBT for Obsessive-Compulsive Disorder

CBT is one of the most widely used treatments for children and adolescents suffering from OCD and may be viewed as a first line of defense in the way of treatment for this population as it is one of the most extensively studied interventions supported by countless clinical trials [88]. Through the lens of the cognitive-behavioral model, it is understood that it is quite normal for most individuals in the general population to experience intrusive and unwanted thoughts [89]. In fact, these normally occurring cognitions do not differ significantly in their content compared to the cognitions experienced by those in the clinical OCD population [90]. For most people, however, these naturally occurring thoughts are given little concern and viewed as nothing more than an odd random occurrence. It appears that it is not until the individual begins perceiving these cognitions as posing a threat for which that individual would be personally responsible for, or as personally important or exceptionally immoral that these thoughts begin to develop into obsessions [91, 92]. It is not the thought itself which is the problem, but the attribution made about the thought.

For example, a teenager may have a fleeting and unwanted thought about stabbing a classmate. Most teens would then attribute this to "brains being weird" and continue about their day. It would not develop into an obsession until and unless this person appraises this thought as meaning that they may actually lose control over their actions and hurt someone. As a result of the distress caused by this fear, the teen may begin engaging in compulsions (e.g., replacing this thought with a more pleasant one, avoiding sharp objects, avoiding school) in an effort to alleviate their feelings of anxiety. So begins an ongoing cycle whereby the temporary decrease in distress produced by the compulsion reinforces the belief that these compulsions are necessary to prevent harm and should be performed again in the future. It is quite cyclical in nature:

the performance of the compulsion can also in turn serve to remind the individual of their initial fear (e.g., stabbing a classmate), increasing the frequency of the intrusive thought, and so the cycle continues on and on.

Due to the high interconnectivity between intrusive thoughts and the subsequent behavior, CBT in the treatment of OCD traditionally focuses on exposure and response prevention (EX/RP). As the function of the behavior (compulsion) is to gain relief from anxiety caused by the thought (obsession), EX/RP works to minimize this association through repeated exposure to stimuli which evokes the obsession and the prevention of the anxiety-based behavioral response. For example, the previously mentioned teenager may be exposed to situations that elicit their fear of harming another student, such as holding a knife in their hand. Following and during the exposure, the teenager must refrain from their typical compulsive behavior (e.g., replacing the upsetting thought with a more pleasant one) with the help of the therapist. Over time, the obsessional fear will lessen as the individual's feared actions (e.g., stabbing someone) do not come to fruition. In this way, the individual learns that the feared consequence will not occur, and that the feelings of anxiety will lessen in absence of the performance of the compulsory behavior. Over time, the powerful relationship between the two is weakened and extinguished.

A standard EX/RP protocol typically begins with the therapist and the client working together to create a customized list of fear provoking situations. These situations are ordered according to the subjective intensity of discomfort elicited by them to create a personalized fear hierarchy. Many of the situations may be imaginal in nature (e.g., imagining holding a sharp object) while others are carried out in real life. The therapist works with the client by helping them gradually expose themselves to these situations over time, beginning with situations which evoke only mild levels of discomfort and then progressing to more stressful ones. The client is also encouraged to conduct exposures themselves, outside of sessions, as homework. This process typically involves 12-16 weekly sessions [2]. Because of the nature of this treatment, any given session may last considerably longer than the standard one hour sessions that many clinicians are used to and time should be managed to fit the individual needs of the client.

An extensive meta-analysis of available literature conducted by Abramowitz, Whiteside, and Deacon [93] revealed that CBT utilizing EX/RP was found to be comparable, if not more effective, in treating OCD symptoms in the juvenile population when compared to individuals treated with psychotropic medications (e.g., SRIs) and individuals in a control condition (treatment with placebos). EX/RP was found to produce an effect size of 1.98 on measures of OCD whereas SRI treatment was found to produce an effect size of 1.13, both compared to placebo groups which produced an effect size of .48. Differences in effect sizes between EX/RP and SRI treatment were found to be significant. Individuals who were treated with EX/RP exhibited mild symptom severity following treatment and individuals given SRIs exhibited symptom severity in low end of the moderate range. EX/RP was also associated with

fewer residual symptoms following treatment. While OCD symptomology was significantly diminished, mild symptomology often still remained following treatment. Researchers accounted for this by considering that experiencing of obsessions and compulsions at a sub-clinical level occurs naturally in the population, and to “cure” OCD entirely may not be realistic.

CBT for Hoarding Disorder

As children are rarely in total control of their living environments, hoarding is likely underdiagnosed in pediatric populations as discussed above. As a result, research in treating hoarding in youth is scant, even compared to other OCD, and much of it has dealt with treatment primarily through the lens of OCD symptomology. Due to retrospective investigation, it began to appear evident that traditional CBT treatment for OCD with hoarding symptomology showed little success [94, 95], perhaps because it was not targeting the underlying difficulties maintaining hoarding behavior. Unfortunately, EX/RP has also been shown to have limited effectiveness in treating hoarding symptomology [96]. This in turn ultimately furthered the understanding that hoarding occurs separately from OCD and should be conceptualized differently.

As a result of such findings, Frost and colleagues [97] proposed a cognitive-behavioral model of hoarding disorder asserting that the excessive acquisition of items stems from a particular set of maladaptive beliefs. The individuals tend to place excessive importance on the items and experience maladaptive emotional attachments to them. These beliefs contribute to maladaptive behaviors, information processing difficulties (difficulty in decision making and categorization), avoidance of emotional distress (experienced by discarding possessions and thus failing to do so), and difficulty focusing and sustaining attention [98]. For example, a child may believe that their family’s old broken possessions (e.g., a broken lamp) are vitally important or they may personify them. They may have fond memories of the item and be emotionally attached to it. Consequently, they continue to collect these possessions over time and are happy to do so. They may not be sure of which ones to throw away and which ones to keep as they are all viewed as personally important. Because of these attachments, the thought of discarding these things is very upsetting for the child and they may refuse to do so. Treatment may include challenging the child’s beliefs that holding on to these things is necessary and involve teaching skills regarding how to separate items into distinct categories, and then incorporate exposing them to graduated instances of discarding items (as is done in EX/RP treatment for OCD). The child may begin by discarding items of smaller and lesser importance (e.g., a broken dish) and then progress to discarding items that they view as more important. They may also be exposed in treatment to new items and subsequently prevented from obtaining them.

A CBT protocol for use in adult populations has since been developed that focuses on psycho-education, organization and problem-solving skills training, cognitive restructuring strategies, and exposures with an emphasis in practicing not only discarding items but also failing to retain items, though exposures are de-emphasized [99]. Utilizing

this treatment protocol, sessions are held weekly for a period of 7-11 months, with in-office sessions lasting approximately 1-1.5 hours and home visits lasting approximately 2 hours [100]. 75% of sessions occur in the therapist’s office, with no less than one session per month occurring in the home. Therapists may help clients with sorting, organizing and getting rid of possessions.

Research supports the effectiveness of this type of CBT in treating adult individuals with hoarding disorder [94, 95, 100-102], specifically if treatment occurs over a “moderately long” (approximately 26 sessions) period of time [96]. Research conducted by Tolin [100] showed effect sizes for two measures of hoarding were considered to be large, with one measuring specific components of hoarding (e.g., clutter, difficulty discarding items and acquiring items) and the other examining degree of clutter inside the home. Those effect sizes were .49 and .67 respectively. Rating of overall global improvement also showed a significant effect size of .14, reported as partial eta-squared. Homework completion suggested a strong correlation ($r = .64$ and above) with treatment success, as individuals with lower levels of homework adherence showed poorer treatment outcomes on post-treatment measurements. Unfortunately, there is as of yet no research examining how effective such a protocol is in helping treat hoarding in children and adolescents when it occurs outside of OCD.

CBT for Body Dysmorphic Disorder

Just as the symptomology of BDD is similar to that of OCD, so too is the cognitive-behavioral conceptualization and treatment. An individual experiences normative intrusive and unwanted cognitions regarding their physical appearance which then grow to become obsessions. In an effort to reduce discomfort caused by these thoughts the individual may engage in compulsions including checking behaviors, excessive grooming rituals, skin picking, seeking of reassurance from others and even avoidance of social situations. The reduction in anxiety then serves to reinforce the behavior and the behavior serves to increase the frequency of the obsession – just as is seen in OCD.

For example, a teenage female may begin to ruminate on the belief that her skin is too pale, rendering them physically unattractive. In an effort to reduce the discomfort experienced by this thought, she may consistently ask friends and family members for reassurance that this is not the case. She may also engage in excessive grooming rituals involving application of self-tanner and makeup, taking up considerable time, and wear clothing in social settings that leaves little skin exposed.

A review by Greenberg and Willhem [103] states that empirical evidence for the use of CBT in treating BDD is promising, showing improvements in BDD symptomology and associated features relative to wait-list controls. Traditionally, CBT approaches to BDD in adult populations aim to address perceptual processing difficulties whereby individuals exhibit a bias toward negative interpretations of both detailed information processing and ambiguous stimuli [104]. Treatment tends to incorporate aspects of EX/RP, cognitive restructuring, activity scheduling and even habit reversal in some instances. Like EX/RP treatment of OCD,

individuals with BDD are placed in situations whereby stimuli elicits obsessions (e.g., a social setting without the ability to hide their perceived flaw) and they must abstain from engaging in their typical behavioral compulsion (e.g., checking behaviors)[105]. In the example listed above, the teenage girl may be exposed to social settings without the ability to wear dark makeup or cover all of her skin. Maladaptive schemas and automatic thoughts held by the individual may also be examined and modified through use of Socratic questioning, examination of evidence and identification of negative thought patterns. This area should not be overlooked, as beliefs about one's appearance may involve deeply held meanings about oneself [106].

CBT has been shown to be effective in treating BDD in adults in both individual and group formats [107-110]. McKay and colleagues used EX/RP to treat individuals with BDD during 5 90-minute weekly sessions over a period of 6 weeks, with some participants also completing a follow-up maintenance program [107]. Individuals who received treatment showed significant improvement of BDD symptomology ($p < 0.001$), as well as decreased depression ($p < 0.01$), and anxiety ($p < .05$). Others have also supported the effectiveness of CBT, demonstrating significant reductions in various measures of symptomology including depression, anxiety and social phobias compared to waitlist controls (ranging from $p < 0.01$ to $p < 0.05$).

While there has been little research focus on CBT for use in adolescent populations with BDD, the idea is not without merit due to its efficacy in treating other highly similar OCD (e.g., OCD) within this population. Available case studies have shown that the clinical features present in BDD in adults is quite similar to those present in children and adolescents [111, 112]. Greenberg [104] offers a comprehensive list of recommendations for adapting standard CBT for use with youth. While BDD may be experienced similarly in adults and teens, teens face a unique set of challenges presented by their level of psychosocial development, including identity development and increased pressure through social interactions. For example, it may be helpful to incorporate the individual's family in treatment through psycho-education and training, specifically if they are helping to maintain symptomology of BDD *via* accommodation such as encouraging and assisting in compulsive behaviors (e.g., checking behaviors, offering continued reassurance, accommodating ritualistic grooming). Assessment is also of particular concern as some teens, particularly young adolescents, may rely on caregivers to provide the practitioner with information, which can be incomplete or lacking. This age group may also present specific challenges over the course of treatment including low levels of insight, low motivation, and decreased engagement as it may be unlikely that they are attending sessions from their own desire to do so. This can be mediated by introducing contingency planning for adherence to and completion of exercises with tangible, age appropriate reward systems. As always, cognitive strategies should also be adapted to suit the individual's needs and developmental stage as their affective and cognitive language may not be as advanced as adult clients. Lastly, Greenberg and colleagues suggest that adolescents in this population may also benefit from social skills training.

While no large-scale studies in efficacy have been conducted at this time, Greenberg [104], did show promising results by utilizing these adaptations in a case study of a 17-year old female named Marcy, and reported that by the end of 12 sessions Marcy's overall symptomology had decreased by 77.8%. Marcy had moved from spending 3 to 8 hours per day engaging in BDD rituals and 8 hours per day thinking about them to spending only 1 to 3 hours per day ruminating and 1 hour per day engaging in engaging in them. Her level of insight and overall quality of life also improved significantly. Importantly, though, Marcy did not appear to maintain this level of reduction in symptomology over time. In the adult literature, the use of booster sessions and prolonged treatment schedules may have been recommended and shown to be effective with adult populations in maintaining symptom reduction and preventing relapse over time [108, 109]. This would likely be crucial in adolescents as well.

CBT for BFRBs

As with hoarding, research into treatment of the BFRBs (hair and skin picking) is less than abundant. Literature pertaining to pediatric treatment of TTM is sparse, with the majority of it utilizing small sample sizes or individual case studies. Even literature pertaining to adult samples remains surprisingly small. Unique to TTM, the behavior can be either positively reinforced or negatively reinforced. For those whose hair pulling behavior is triggered by feelings of sadness or anxiety, the removal of hair provides relief or distraction from these negative emotions. For others, hair pulling provides feelings of pleasure or gratification. The behavior may also be reinforced by other individuals. A child may be experiencing significant levels of stress, and finds that hair pulling not only relieves and distracts from this negative feeling but it also gains them extra attention from care-givers.

The focus of treatment for the pediatric population relies heavily on behavioral, rather than cognitive components, with behavioral treatment appearing efficacious in even very young children [113]. In early onset TTM, under the age of 6, it appears that behavioral therapy is both the most widely used form of treatment and one of the most successful [56]. Understandably, given the young age of these individuals, the cognitive component found in more traditional CBT techniques is omitted. A purely behavioral approach is not without its limitations, though, as young children may struggle with awareness training, self-monitoring and the ability to consciously engage in competing responses [114]. Similarly, behavioral therapy (incorporating response prevention, relaxation training, and habit reversal training) has also shown to be effective in school aged children and adolescents [58].

Research has shown that youth may engage in two different "types" of hair pulling behaviors. Automatic pulling often occurs outside of consciousness and may be habitual, whereas focused pulling most often occurs in the context of goal-oriented cognitions [115]. Behavior therapy alone has been found to be sufficient in producing significant levels of symptom reduction, but it appears TTM is not without underlying cognitive components as hair pulling episodes have been shown to be evoked by thoughts

concerning the hair itself (e.g., “this hair is bad”) and various affective states (e.g., depression and anxiety)[116-117]. As a result, it is possible that supplementing behavior therapy with more traditional CBT methods involving cognitive restructuring may help to address these underlying cognitions and even the affective states that may accompany the behavior for a more comprehensive form of care.

In adult populations, CBT has been shown to be efficacious in treating TTM [118-120], superior to pharmacotherapy treatment, and may be useful in group settings, though a group setting may decrease its overall effectiveness [121]. A comprehensive analysis of available literature showed habit reversal therapy to produce the largest effect size ($ES = 1.14$) compared to treatment with SRIs ($ES = .02$) and treatment using the antidepressant Clomipramine ($ES = .68$) [122]. Work by van Minnen and colleagues [118] demonstrated large effect sizes for behavioral therapy ($ES = 3.80$), substantially larger than the effect sizes demonstrated for treatment with a medication (e.g., fluoxetine) and waitlist controls. The effect sizes for the latter two groups were .042 and 1.09 respectively. Tolin [72] utilized adult CBT treatment for TTM in a pediatric population of 22 individuals and produced quite promising results. Treatment over a period of 8 weeks incorporated competing response training (whereby the individual engaged in a behavior incompatible with hair pulling), stimulus control (altering of one’s environment to reduce likelihood of hair pulling), progressive muscle relaxation, cognitive restructuring, covert modeling, and relapse prevention strategies. Bi-weekly follow up sessions over another period of 8 weeks were also conducted with emphasis on relapse prevention and reinforcement of previously learned skills. Results showed that 77% of participants were responsive to treatment, demonstrating not only a reduction in TTM symptomology but also a reduction in overall levels of depression and anxiety.

In cases of excoriation, some parents may avoid seeking treatment for their children for a number of reasons including social embarrassment or a belief that the behavior is nothing more than a bad habit, and they may be unaware that it is a legitimate disorder [123]. This may also be the case for some parents of children suffering from TTM. Individuals who began skin picking in childhood wait, on average, 25 years prior to seeking treatment [86]. Similar to treatment of trichotillomania, it appears that research among adult populations shows evidence to support the efficacy of habit reversal in treatment of habitual behaviors [124, 125]. They suggest that effective treatment involve awareness training, competing response training, contingency management in an effort to reinforce competing behaviors and relaxation training. Several case studies support the effectiveness of these components in treating compulsive skin picking [126-128] and it is suggested that this treatment is effective compared to wait-list controls [129]. These results are extended by another case study in treating adults suffering from excoriation using CBT methods [130]. While all of the individuals treated were adults they all reported that they began skin picking in childhood and adolescence. It appears they responded well to CBT treatment involving habit reversal as well as emotion-regulation training and cognitive restructuring. Unfortunately, these studies all suffer from

small sample size, lack of control over conditions, and may be confounded by the presence of other dermatological skin disorders, an issue not uncommon amongst individuals with excoriation. To our knowledge, no large randomized controlled trials concerning efficacy of treatment with the pediatric population have been conducted.

Novel CBT Approaches for the Treatment of OCRD

While traditional CBT interventions, specifically those that focus heavily on behavioral components, have been proven effective in the treatment of OCRD, the data is also clear that there are a significant number of treatment non-responders. Because of this, clinicians and researchers are continually examining supplementing these evidence-based treatments with additional or novel components or methods of delivery. This is an area where there is little data for disorders outside of OCD. As such, much of the below information is based on a combination of best available evidence from studies with adults, evidence from studies with children (where possible), the extensive clinical experience of the second author, and consultation with other experts in the field. With this caveat, we will review below nine novel or supplemental approaches to cognitive-behavioral treatment: pharmacologically-enhanced treatment, intensive outpatient treatment, intensive inpatient treatment, augmenting CBT with other therapies, home-based treatment, treatment with an increased cognitive focus, group therapy, family-focused treatment, and technologically-enhanced or delivered treatment.

Pharmacologically-Enhanced Treatment

Though CBT treatment utilizing EX/RP is widely considered to be a first line of treatment for pediatric OCD populations, use of serotonin reuptake inhibitors continues to be more widely employed. This is problematic as use of medication has shown limited degrees of efficacy, and symptom remission has proven rare in response to this treatment [131]. In fact, work by Storch and colleagues suggested no difference in treatment success for children given CBT in conjunction with a serotonin reuptake inhibitor versus children given CBT with a placebo [132]. New research, however, has suggested utilization of alternate medications. For instance, some studies have used atypical antipsychotics and NMDA agonists in an effort to improve memory consolidation [133, 134] in conjunction with CBT.

The use of the NMDA receptor partial agonist, D-cycloserine (DCS) has also shown promising results. This medication is particularly interesting because, while its use doesn’t necessarily show greater levels of treatment response, it does appear to correlate with faster treatment response. These effects are hypothesized to be the result of the medications ability to impact learning, specifically its ability to facilitate fear extinction [2]. Because EX/RP essentially involves the extinction of learned fears, pairing this form of treatment with DCS appears to show faster rates of symptom improvement, and thankfully, it has been studied in pediatric populations. Storch and colleagues conducted a randomized, double-blind study comparing the effects of EX/RP paired with DCS to EX/RP paired with a placebo in a sample of 30 pediatric individuals [135]. While

treatment effects for the group given DCS were only mild to moderate, the study demonstrated the need for continued research. A more recent study examined the usefulness of CBT with DCS augmented EX/RP relative to a placebo control group in 17 children and adolescents with “difficult to treat” OCD [136]. Both groups showed significant symptom improvements with no significant differences. That said, significant differences in effect sizes (ranging from 0.26 to 0.70) were observed between groups at one-month follow up which the authors attribute to an acceleration in therapeutic gains over time. Combining pharmacological treatment has indeed been shown to be superior to pharmacotherapy alone [137].

Intensive Treatment

Another modification to standard CBT treatment, without use of medication, includes intensive cognitive-behavior therapy (I-CBT), which has been garnering increasing empirical support for treatment of pediatric populations suffering from OCD [138-140]. Short form, intensive treatments may increase patient access to quality, evidence-based care but is not without some limitations. It is important to note that this treatment may not be equally beneficial for all clients, as it often requires absence from school, absence from work on the part of caregivers, and perhaps temporary relocation as not all practitioners may be adequately trained to provide such services.

I-CBT methods are not qualitatively different from traditional CBT and EX/RP protocols previously discussed, but are provided in a highly condensed manner, over a period of 3-4 weeks during 90-minute sessions [141]. Providing CBT in this more condensed form as been shown to provide several benefits in other populations, including quicker relief from symptoms and enhancing motivation on the part of the client [142, 143], and may be ideal for individuals unable to find access to other empirically supported treatments, or individuals experiencing particularly severe symptoms [144]. Predictive factors for treatment outcome include symptom severity and degree of accommodation provided by family members [144]. Unsurprisingly (and similar to other forms of treatment), as individual symptomology severity increases, treatment effectiveness decreases.

Also, many parents accommodate their child's OCD behaviors to various degrees, which can significantly and negatively impact treatment outcome. As a result, a higher degree of family involvement in treatment, in a specific effort to target their accommodation engagement, may help improve symptom relief. Indeed, research has shown that incorporating family therapy (psychoeducation, processing, and training in reinforcement techniques for parents) with traditional CBT methods including EX/RP, especially in younger children, may be more effective than CBT utilizing relaxation techniques and could be considered a “first line choice” in treating young individuals with OCD [145].

Literature concerning intensive CBT for other OCD in the pediatric population was, unfortunately, unavailable. However, intensive CBT for skin picking in adults has produced significant reductions in symptomology compared to wait-list controls, with individual's maintenance of symptom reduction at post-treatment follow-up 8 weeks later

[146]. Intensive treatment of BDD, hoarding, and TTM in youth may yield similar results, but the research has not been conducted.

Home-Based Treatment

Though published documentation of utilization with pediatric populations is limited [147], the clinical experience of the second author suggests that home-based sessions can be highly effectively used to either supplement more traditionally delivered CBT or completely in place of it. The scant literature examining home-based CBT for adults indicates that it is at least as effective as that delivered in an office or hospital setting [148-150], and as such it is highly likely to show the same effectiveness in a pediatric population.

Home based treatment may be particularly useful for symptom assessment [151], assessing and overcoming accommodation from family members, increasing generalizability from in-session exposures to other environments, and dealing with compulsions that occur specifically in the home. In addition, a clinician traveling to the home can decrease the difficulties faced by many parents in getting their child to treatment due to avoidance and resistance, including oppositional and defiant behavior. This could be particularly useful with the highly problematic rage attacks due to increased anxiety caused by obsessions, which are quite common in the pediatric population [152].

With the exception of the physical location, however, little changes in terms of what CBT for OCD involves. There is still a focus on EX/RP, which can sometimes be easier than in the office setting, as many youth have numerous home-specific symptoms, and modeling for parents how to respond to their child's anxious behaviors. But, as with the provision of any home-based service, there are several issues unique to treating OCD in the home. First, there are potential ethical concerns to take into consideration. Maintaining confidentiality can be challenging in the home. This can be due to the lack of an area specifically devoted to therapy, which means that other family members, friends, or even neighbors may be in and out of the home. Boundaries may also become blurred more readily in the home, given that the therapist is quite literally placing themselves inside the family's daily life. For instance, the second author has had numerous families invite him to stay for a meal at the conclusion of a session. Making a very conscious effort to maintain professional boundaries is essential when performing these services.

Family-Focused Treatment

In dealing with pediatric populations, incorporating family or caregivers into treatment may have many beneficial effects. Children and teens spend considerably more time around family members than their therapists and educating these highly influential people in the child's life can help minimize accommodation issues, their own personal levels of distress, and possibly even increase adherence to treatment and the completion of homework assignments. Involving the family in therapy can help create a vital support network and also ensure that the hard work being done in sessions isn't being counteracted by events in the home. Family members may be significantly impacted by

their children with an OCRD diagnosis, with up to 75% of family members of adult patients with OCD reporting significant disruptions in their daily life [153]. They may begin changing their own behaviors and routines to accommodate the individual or even help the individual complete behaviors and ritual in an effort to be helpful, and research shows that these types of accommodation occur in the majority of families who have a child with a diagnosis of OCD [2]. Furthermore, dysfunction within the family and rate of negative interactions between family members had been shown to have a significant negative correlation with treatment outcome in individuals with OCD [154, 155]. Overall, research supports the extreme usefulness of including families in treatment for adults with OCD [156]. Since children likely rely even more on family members than adult patients, the need for incorporating family members into the treatment of children and teens is obvious. Because OCD and the other OCRD all have overlapping symptomology it is not without question that incorporating family members would likely be beneficial for all of the presently discussed disorders. Additionally, it has been shown that social support is a key component in bolstering behavioral treatment success [156].

In treating hoarding behaviors in children, research supports the notion that family therapy may be highly useful [157]. In Ale *et al.*'s study, the treatment protocol was unique in that exposures conducted addressed not only the discarding of objects but also cues mediating the acquisition of items as well. Diminishing caregiver and family member accommodation was central to treatment and training in parental contingency management was heavily emphasized. Differential attention and contingency management systems were utilized to diminish disruptive behaviors. Home based visits may also be helpful as this is the primary location in which the behavior occurs.

Family based services have also been shown to be useful in the treatment of BDD among adolescent patients. A recent case study utilized intensive family based CBT to treat a 16 year old female [158]. 14 sessions were conducted over consecutive weekdays with an additional three sessions administered for follow up over a period of three months. The patient's mother was provided psycho-education in the area of accommodation and was encouraged to abstain from providing her daughter with reassurance. Sessions consisted of both EX/RP using a graded fear hierarchy and cognitive restructuring concerning the individual's desire for approval and self-critique. She was also instructed to conduct exposures on her own between sessions and showed significant improvement in her symptoms over time and maintained these reductions at follow-up. The mother reported a rapid decrease in the frequency of her daughter requesting reassurance.

Augmenting CBT with other Therapies

CBT is a highly flexible treatment modality and can easily be paired with and augmented by other forms of treatment that share similar theoretical foundations. Because some individuals, and their families, may exhibit low levels of insight with regard to OCRD symptomology, incorporation of motivational interviewing (MI) to assess a patient's and their family's readiness to change has also been shown to be

useful [159]. MI techniques typically involve Socratic and guided questions used to probe the individuals desire to enact positive change in their lives and highlight reasons for doing so. Questions may include asking the patient (and/or their family) how they think the individual's symptoms negatively impact their lives and the lives of others, why they came to therapy (or why they think they are there if brought by parents), what they think other people close to them might be concerned about, and what they think will happen to their symptoms if they don't participate in treatment. The goal in MI is to help the patient realize the need for treatment themselves by helping them examine various outcomes and the impact their decisions have on themselves and those around them in the hopes that this critical examination will increase their motivation in treatment.

Another form of treatment that pairs well with CBT is Dialectical Behavior Therapy (DBT). In work with adults, a form of CBT modified to incorporate DBT suggests preliminary evidence in support of its treatment efficacy [160]. DBT and CBT largely share a similar theoretical foundation, with DBT utilizing a strong emphasis in teaching skills to the client useful in the identification, understanding and regulation of emotions as well as the ability to tolerate emotional distress. DBT is highly structured in nature and grounded in simplicity. It is also easily utilized by therapists with a thorough understanding of CBT interventions. While DBT has been an established form of treatment for several disorders for quite some time, its pairing with CBT for the OCRD population may widen the breadth of a currently limited knowledge base in effective interventions and allow for increased ease of access to treatment.

There has also been recent growing support for the usefulness of Acceptance and Commitment Therapy (ACT), particularly in the treatment of OCD. As the title suggests, ACT encourages individuals to accept the present moment for what is as well as any corresponding cognitive and affective changes. ACT may convey this acceptance through conceptualizing thoughts as mere electrochemical changes in our brains. For many individuals diagnosed with an OCRD, the repetitive behaviors serve the function of minimizing anxiety and distress often produced by troublesome thoughts which the individual wishes to avoid. ACT also encourages individuals to react to these situations, cognitions, and levels of distress in meaningful, committed, goal driven ways. In this way, ACT addresses the same problem behaviors most commonly addressed with exposures as well as the underlying cognitive events. Meta-analytic work has shown recently that ACT may be useful in the treatment of OCRD [161]. The researchers showed that ACT demonstrates promise for use in the treatment of several anxiety disorders in adults, and have suggested modest evidence in its usefulness in treating OCRD. ACT has also been shown to produce clinically significant decreases in OCD symptom severity, and comorbid depression in adults when compared to progressive relaxation training [162].

Increased Cognitive Focus

While the bulk of research focuses on behavioral aspects of treatment, a greater emphasis in cognitive restructuring throughout treatment, paired with EX/RP, focusing on deeply held beliefs (schemas) has been shown to be useful in

adult populations with OCD [163]. Of course, the usefulness of these techniques is partially dependent on the age and developmental level of the child, though it is possible that this component may also be helpful in treating older pediatric populations in addressing heightened levels of early maladaptive schemas. Meta-analytic work has suggested however that while increased cognitive focus in the treatment of OCD is useful, it may not be more effective than EX/RP alone [164]. The study authors asserted, though, that this finding is hampered by the relatively low volume of outcome studies examining cognitive behavioral therapy alone.

Neuroscience studies in adults with BDD suggest that one of the factors involved in the maintenance of the disorder is the tendency for individuals to attend selectively to the details of objects in their visual field rather than to the visual field as a whole [165, 166]. Consequently, Wilhelm, Phillips, Fama, Greenberg and Steketee [167] developed a manualized CBT treatment protocol with specific attention paid to this unique tendency. In addition to more traditional CBT techniques, “perceptual retraining” is given special focus. Individuals are asked to describe their complete physical appearance without focus on specific body areas. They are also instructed to use objective language in doing so. Specialized modules are also included in an effort to treat a wide variety of clients including treatment plans for individuals considering cosmetic surgery, and individuals whose primary focus concerns muscle mass and shape (primarily males).

Similar attentional biases have also been implicated in social anxiety disorder (SAD) [168]. Indeed, BDD co-occurs in individuals with SAD at a greater rate than in individuals with OCD [169]. With this in mind it is not surprising that CBT aimed at treating SAD alone has been shown to also result in a decrease in BDD symptomology, and treatment targeting SAD based on attention retraining has been shown to decrease BDD checking behaviors and negative beliefs (without effecting fixing and appearance correcting behaviors) [170]. Interestingly this same research showed CBT incorporating attentional retraining to have had minimal effects in diminishing SAD severity. Implications of these findings stretch beyond the notion that SAD and BDD share maintenance factors. Because there have been so few studies concerning innovative treatments for BDD in adolescent populations, it may be difficult for individuals to find practitioners qualified to treat the disorder. SAD is not only significantly more common within the population but it is also arguably better understood. These findings may suggest that practitioners with a thorough understanding of using CBT in the treatment of SAD may be able to utilize similar techniques to effectively treat this highly unique population.

Group-Delivered Treatment

Delivery of treatment in a group setting has shown promising results in treating OCD and may help relieve difficulties that many families face in finding easy access to effective treatments [171, 172]. Investigation comparing individual CBT treatment to group CBT treatment in adult OCD patients has shown little difference in treatment

success. Meta-analysis of several such comparison studies showed a mean effect size difference between groups of 0.15 in favor of individual treatment [173]. While the effect size is significant, the same researchers demonstrated that group treatment is still effective in treating OCD and produces large effect sizes, though perhaps slightly less so than individual therapy. Ferrell and colleagues conducted a much needed study concerning group CBT specifically for pediatric populations [172]. Forty-three children and teenagers with a diagnosis of OCD (86% of which also had a secondary comorbid diagnosis) participated in weekly group family-based CBT over a period of 13 weeks and showed significant symptom improvement.

Similarly, group format CBT for adult hoarding populations has been shown to be as efficacious as individual treatment [174]. Unfortunately CBT often requires a trained professional and can often be time consuming. Frost and colleagues demonstrated significant symptom improvement in adult hoarders through use of a support group facilitated by a non-professional whose primary duty was simply to keep individuals on topic [175]. These findings were furthered by research utilizing a waitlist control group, which demonstrated large effect sizes ranging from .89 to 2.69 across various measures of hoarding behavior [176].

On the other hand, a comparison study examining effectiveness of group behavior therapy compared to support therapy for use in adult TTM patients showed only partial support for these modalities [121]. While all participants showed some symptom improvement, they were not clinically significant. In treatment of adult individuals with BDD, group therapy has shown promising results. Wilhelm and colleagues [177] demonstrated significant reductions not only in BDD symptomology but also in depressed mood in a small sample of participants who participated in weekly group CBT sessions over a period of 12 weeks.

It appears that group therapy is effective for some OCD disorders, and continued research is needed to expand these findings. While the majority of literature reflects work with adult patients, it is likely that adolescents may find such a setting helpful. Group treatment focused on younger children may need to be highly modified, although research has shown it can be highly effective for anxious children at up to a year post treatment [178].

Technology-Delivered or Enhanced Therapy

The use of computerized treatment has been highly investigated for helping those with OCD, though primarily for use with adult populations. One of the largest advancements occurred in 1997 with the advent of a program entitled BT STEPS that used an interactive voice response system designed as an interactive tool for self-assessment, treatment planning and self-administered behavioral therapy [179]. The use of such programs have since shown promising reductions in OCD symptomology [180, 181]. In the largest study conducted examining computer administered treatment, Greist *et al.*, demonstrated that individuals in both the BT STEPS program and individuals in a therapist-lead behavioral treatment program showed significant symptom improvement compared to individuals in a control relaxation group [182]. The clinician lead group demonstrated the largest effect size.

Virtual reality technology has been utilized previously in the treatment of specific phobias and has been suggested as a logical next step in use with ERP for OCD and other disorders [183].

Further use of novel technology driven treatments have shown CBT administered *via* telephone to be promising in treating not only OCD but also trichotillomania and chronic skin picking in adults [184]. The efficacy of an internet based self-help group in treating hoarding behavior in adults was recently investigated for the first time [185]. The group program required that individuals submit applications to enroll and take steps to reduce compulsive behaviors. They are required to post behavioral goals and actions taken to achieve these goals on a monthly basis, and complete various CBT exercises (e.g., thought records). The group did not include formal instruction by licensed therapists; instead, group leaders instructed members on how to conduct exposures and engage in cognitive restructuring themselves. Individuals who did not actively participate and meet requirements were removed from the group. Surprisingly, participation in the group showed a decrease in hoarding behaviors over time. Despite clear limitations, lack of a controlled sample and the fact that group leaders were not licensed mental health practitioners, web-based delivery of CBT treatment by licensed practitioners for younger patients with the disorder may be particularly useful in aiding in treatment accessibility, given the specificity of the disorder.

CBT-W, developed by Muroff and colleagues [186] and featuring web-camera delivery of treatment for hoarding in three adult client's homes over a course of 26 individual sessions, showed promise, though it was noted that the ability to move the computer to different areas of the living space appeared to be prudent. Web-based treatment, utilizing a visual component (web-cams, photographs) may provide some of the benefits of home based treatment for individuals living in outlying regions or for those who would not be able to access treatment otherwise. Mouton-Odum and colleagues [187] developed an online self-help treatment strategy for individuals experiencing trichotillomania (StopPulling.Com) and have shown users to exhibit significant symptom reductions over time. Users of the program were provided with instruction for monitoring behavior, provided with a functional assessment that they completed themselves and were given treatment strategies involving coping skills and stimulus control techniques. Subsequently, a similar internet-based self-help treatment tool was developed for individuals suffering from excoriation and was shown to produce significant reductions in symptoms comparable or superior to treatment using medication (StopPicking.com) [188]. This program as well was designed to assess and increase client awareness of the antecedents, and consequences of their behavior, teach coping skills designed to reduce the frequency and severity of skin picking, and facilitate maintenance of symptom reductions. Psycho-education is also offered in various forms. Of course, with any web-based service, issues of confidentiality should be of primary concern. Other concerns include the ability to maintain a collaborative therapeutic alliance with the client and high degrees of rapport over what some may consider impersonal interactions.

Inpatient Treatment

The UCLA OCD Partial Hospitalization Program has been utilized previously to treat individuals presenting with severe cases of OCD and related spectrum disorders. This protocol was recently adapted for use in treating adults exhibiting hoarding disorder, showing some improvement in symptoms severity, though confounded as many participants also received medication [93]. The program consisted of daily CBT treatment in individual and group formats over a period of 6 weeks with emphasis on psycho-education, exposures, cognitive restructuring, and skill building. While this has not been utilized in such an intense form among children, it is possible that a similar program could be adopted for this population. Understandably, however, children do not tend to present with such severe hoarding behaviors for a myriad of reasons as discussed previously. This said, with the understanding that most chronic individuals with the disorder began the behavior during childhood and rarely sought treatment, early intensive treatment may prove quite useful in treating the disorder before it becomes chronic.

CONCLUSION

It is clear that there is still much to be understood regarding OCRD in the pediatric population, from both a phenomenological perspective and in terms of best treatment options. Hopefully, the advent of this diagnostic category and the recognition of many of these problems as separate from OCD will encourage interest amongst psychiatric and psychological communities and help foster continued research regarding evidence based treatment practices for children and adolescents. The bulk of literature concerning treatment methods, both traditional and novel, deals largely with adult populations and research into its usefulness with pediatric populations is without a doubt the logical next step.

As surveyed above, the usefulness of CBT (both traditional and novel approaches) with pediatric populations is not without merit, despite this limited research. CBT with an emphasis on EX/RP has been shown useful in treating a myriad of other disorders in children and teens and appears to be the leading modality to employ across the OCRD. While much of the existing research suffers from limitations, including small sample sizes and lack of controlled trials, the research that is available is highly promising. The continuing efforts of researchers and clinicians to both further establish the evidence base for traditional CBT and develop new methods of treatment delivery to youth with OCRD is to be commended and applauded. Early and effective treatment methods can be life-changing for children, adolescents, and their families, given the too often chronic nature of OCRD. It is hoped that this review can provide structure for further research and investigation into improving treatment outcomes.

CONFLICT OF INTEREST

The author(s) confirm that this article content has no conflict of interest.

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