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Cognitive Behavior Therapy for Childhood Repetitive Behavior Disorders: Tic Disorders and Trichotillomania

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Abstract

The goal of this paper is to provide an overview of cognitive-behavior therapy (CBT) for repetitive behavior disorders. Tic disorders (i.e., Tourette's syndrome, chronic tic disorders) and trichotillomania (i.e., chronic hair pulling) are the most often studied and (arguably) most debilitating of these conditions. Therefore, this article will focus on the efficacy of CBT for tic disorders and trichotillomania. After a brief introduction to these disorders, the author will provide an overview of CBT for children presenting with these concerns. In particular, this review will focus on a therapeutic technique that is at the core of most all CBT-based interventions, habit reversal training. Discussion of two recent empirical studies pointing to the immense potential of CBT for the treatment of childhood repetitive behavior disorders will follow. Finally, future areas of research will be discussed.

Keywords

children; CBT; tic disorders; trichotillomania; habit reversal

The aim of this brief review paper is to provide interested readers with an overview of cognitive-behavior therapy (CBT) for repetitive behavior disorders. The term repetitive behavior disorder encompasses a variety of conditions including tic disorders (i.e., Tourette's syndrome, chronic tic disorders, transient tics), trichotillomania, skin picking, nail biting, and bruxism (teeth grinding). In an effort to avoid repetition, no pun intended, the focus of this discussion will center upon the most often studied and (arguably) most debilitating of these conditions: tic disorders and trichotillomania. After an introduction to each disorder, I will provide an overview of CBT for children presenting with these concerns. In particular, I will focus on a therapeutic technique that is at the core of most all CBT-based interventions, habit reversal training. Next, I will discuss two recent empirical studies pointing to the immense potential of CBT for the treatment of childhood repetitive behavior disorders. Finally, I will discuss some future areas of research. First, a disclaimer is necessary.

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Tic disorders and trichotillomania will be the focus of this review. However, it is important to note that CBT (broadly-defined) and the unique therapeutic techniques described herein demonstrate similar benefit across most all repetitive behavior disorders. In sum, it is my hope that readers will come away from this brief review with a better understanding of these child-onset disorders, cognitive-behavioral interventions available to children (and their families) afflicted with these conditions, and important areas for further investigation.

An Introduction to Tic Disorders and Trichotillomania

Tic Disorders

The Diagnostic and Statistical Manual of Mental Disorders, Fourth edition, Text Revision (DSM-IV)¹ describes tic disorders as involving the presence of one or more motor and/or vocal tics (i.e., sudden, rapid, recurrent, nonrhythmic motor movements or sounds). The most studied tic disorder, and most often referenced in the popular media, is Tourette's Syndrome (TS). TS is characterized by multiple motor tics and one or more vocal tic(s) present for at least one year. Other tic disorder diagnoses include chronic tic disorder (i.e., presence of motor or vocal tics [but not both] for more than one year) transient tic disorder (i.e., presence of motor or vocal tics for less than one year), and tic disorder, not otherwise specified.¹ Tics can vary in location and/or topography, wax and wane over time, and can be simple or complex. Simple tics may include facial grimacing, head and shoulder jerking, leg kicking, stomach tensing, grunting, coughing, and throat clearing. Complex tics include touching objects or other people, hopping, tapping or straightening objects, obscene gestures, echolalia, and shouting insults or obscenities (coprolalia). Although coprolalia is frequently depicted in the media, it actually occurs relatively infrequently among those with a tic disorder diagnosis.

Tic disorders (i.e., TS, chronic tic disorder, or transient tic disorder) occur in as many as 6.6% of children and adolescents.² More specifically, TS demonstrates a prevalence of approximately 1% in the general population though estimates vary considerably from about 0.04% to 3.0%.¹⁻⁴ TS is more common in males than females^{1, 5} with an average age of onset at 5-7 years of age.^{1, 6} Children with TS often report experiencing a premonitory urge. This urge is often described as an aversive itching, tickling, or tensing sensation in the area of the body where a tic is about to occur⁷⁻¹⁰. Tics usually result in a temporary reduction in or amelioration of the premonitory urge. As many as 93% of persons diagnosed with tic disorders experience some form of urge, feeling, or "need" to engage in a tic.⁹ Most typically, premonitory urges are experienced by older children (i.e., 10+ years of age) yet children as young as 7 may also report such urges. There is some evidence to suggest that, in younger children, the urge is present but not well formed.¹⁰ Woods et al.¹⁰ developed a measure, the Premonitory Urge for Tics Scale (PUTS), designed to assess the presence of these urges in children. From a therapeutic perspective, identification of a child's premonitory urge may be especially useful for enhancing the implementation and efficacy of certain behavioral interventions (i.e., habit reversal training).

Perhaps the greatest concern for individuals diagnosed with a tic disorder is the presence of comorbid psychiatric diagnoses.^{11, 12} Research suggests that as many as 95% of individuals diagnosed with a tic disorder meet diagnostic criteria for another psychiatric condition¹³ with attention-deficit hyperactivity disorder (ADHD) and obsessive-compulsive disorder (OCD) among the most common comorbid concerns.^{12, 14} Research has also suggests elevated rates of mood and anxiety disorders among those with tic disorders.^{4, 15-17} These children also demonstrate increased rates of disruptive behavior problems (e.g., conduct and oppositional defiant disorder).^{4, 5, 13}

Trichotillomania

Trichotillomania (TTM) is classified as an impulse control disorder in the DSM-IV.¹ Hair pulling is the trademark symptom of the disorder yet, according to the DSM, pulling must also be accompanied by an increasing sense of tension prior to or while attempting to resist pulling (*criterion B*) and gratification, relief, or pleasure following pulling (*criterion C*). However, most clinical researchers confer a diagnosis of TTM in the absence of criterion B and/or C¹⁸⁻²⁰. Proposed changes to the DSM V indicate that the inclusion of criterion B and C will likely no longer be a prerequisite for diagnosis of the disorder. This may be particularly beneficial for younger children as they may lack the cognitive ability to adequately describe the experience that these criteria are meant to assess. Children with TTM pull their hair from anywhere that hair grows including (but not limited to) the scalp, eyebrows, eyelashes, and, among older children and adolescents, pubic regions.²¹ As is the case with most psychiatric conditions (though tic disorders are an exception), the child must also experience clinically significant impairment in one or more areas of daily functioning (i.e., interpersonal relationships, academics, etc.) as a result of hair pulling.

Recent estimates suggest that the prevalence of trichotillomania is approximately 1.2% in the general population (when omitting criterion B and C).²² Some believe, however, that the disorder is more prevalent in children than adults²³ and that the female to male ratio may be lower in children.²⁴ Unlike OCD, trichotillomania does not demonstrate a bimodal age of onset. The average age of onset is approximately 9-10 years of age²⁵ though evidence suggests that hair pulling can begin as young as 18 months.^{20, 26} Importantly, children (and adults) with TTM report experiencing two disparate styles of pulling referred to as automatic and focused pulling. Automatic pulling is characterized as pulling outside of one's awareness (i.e., while watching TV, reading a book). Focused pulling is characterized by pulling in response to an urge, (i.e., reduce tension), impulse (i.e., experience pleasure or gratification), or negative emotional state (i.e., anxiety, depression, stress). The vast majority (~96%) of children report experiencing both styles of pulling.²⁷ Flessner et al.²⁸ developed an assessment tool, the Milwaukee Inventory for Styles of Trichotillomania-Child Version (MIST-C), to more adequately measure these disparate pulling styles. Akin to the PUTS, the MIST-C is validated only for children 10 years of age and older and may be useful for informing the selection of appropriate treatments.

Empirical evidence suggests that about 70% of children with TTM may also meet diagnostic criteria for other psychiatric diagnoses.²⁹ Recent data from a treatment-seeking sample demonstrated that 39.1% of children with TTM presented with a comorbid psychiatric diagnosis. Of these children, 30.4% and 10.9% presented with either an anxiety or externalizing disorder, respectively.²⁵ Generalized anxiety (13.0%), social phobia (8.7%), OCD (6.5%), ADHD (8.7%), and oppositional defiant disorder (6.5%) were among the most common diagnoses. A larger, internet-based study found that 38.3% of children had been previously diagnosed with at least one other mental health disorder. Among these diagnoses, anxiety disorders (24.1%), mood disorders (18.8%), and ADHD (16.5%) were the most common.³⁰ Very young children with trichotillomania also present with marked comorbidity. One study found that 50% of toddlers who pulled their hair met requirements for a comorbid anxiety disorder, 40% displayed developmental problems, and 100% of the sample had family stressors (i.e., parental separation, homelessness, or parent mental illness).²⁶ This data suggests that early childhood trichotillomania is not just a benign habit.

Cognitive Behavior Therapy for Childhood Repetitive Behaviors Disorders

The term cognitive-behavior therapy (CBT) implies the use of cognitive- or acceptance-based strategies. In contrast to many other childhood psychiatric conditions (i.e., anxiety and mood disorders), CBT for repetitive behaviors disorders does not always utilize such

strategies. More typically, if anything, such strategies (i.e., cognitive restructuring) are used as only one small part of a larger treatment protocol. As a result, CBT for trichotillomania, tic disorders, and other repetitive behaviors disorders can be thought of as a comprehensive approach to treatment that includes a variety of therapeutic techniques: (1) awareness training; (2) function-based interventions; (3) self-monitoring; (4) habit reversal training; (5) aversion; (6) massed practice; (7) relaxation training; (8) social support; and (9) stimulus control.^{31, 32} Not all of these treatment techniques are used regularly. For example, massed practice involves asking the patient to engage in their targeted behavior (i.e., motor/vocal tics) as quickly, accurately, and putting forth as much effort as possible for a predetermined amount of time with brief periods of rest interspersed (i.e., engage in the tic for 3 minutes, rest for 1 minute, and so on).³³ In general, however, the use of massed practice does not hold much empirical support. Additionally, these therapeutic techniques are rarely used in isolation. That is, most CBT protocols incorporate several of the techniques described above. While this provides for a more comprehensive approach to treatment, it also makes identifying the critical component(s) to therapeutic success or comparing results across studies difficult. One treatment technique, however, is generally considered the gold standard or core component to CBT protocols for repetitive behaviors, habit reversal training.

Habit Reversal Training

Habit reversal training (HRT) was first developed nearly 40 years ago by Azrin and Nunn³⁴ for the treatment of nervous habits and tics. Originally, HRT was a comprehensive procedure consisting of several steps. However, it has changed somewhat in the past several decades. A recent study by Flessner and colleagues³¹ surveyed 67 experts and found that self-monitoring (i.e., asking the patient to track his/her hair pulling, motor/vocal tics, etc.), awareness training, competing response training, and stimulus control procedures (i.e., modifying the environment to reduce cues for hair pulling) were the most frequently endorsed elements of HRT employed for the treatment of trichotillomania. Stimulus control procedures, as defined above, are generally not employed often for the treatment of tic disorders. An abbreviated version of HRT has been demonstrated to be equally as effective and easier to administer than the original procedure developed by Azrin and Nunn.³⁵ Germane to the aims of the current review, this abbreviated (simplified) version of HRT is applicable across all childhood repetitive behaviors disorders and consists of three primary components: awareness training, competing response training, and social support.³⁶⁻³⁸

Awareness training consists of several key elements. First, the therapist asks the child to describe in great detail and reenact the repetitive behavior (i.e., hair pulling, motor or vocal tic, etc.) that is the target of treatment. Subsequently, the child-therapist dyad play a game in which the child must accurately detect instances of his/her target behavior as well as instances in which the therapist mimics the behavior. If the child's behavior does not occur naturally (as is likely to be the case for children with trichotillomania), he/she is instructed to simulate the behavior. This exercise continues until the child has correctly identified four out of five instances of their and the therapist's behavior. The child-therapist dyad then proceeds to identify "warning signs" for the behavior in question. For example, a child may report a tickling sensation prior to clearing his/her throat (i.e., a premonitory urge) or moving her head down and to the left, accompanied by an upward movement of her left arm, prior to pulling hair from her scalp. Again, the child must correctly identify four out of five warning signs for the targeted behavior before proceeding to the second component to simplified HRT, competing response training.

In **competing response training**, the child is taught a behavior that is incompatible with the target behavior. For example, a child who pulls her hair might clench her fists or place her hands underneath her legs upon identifying a warning sign for hair pulling. Alternatively, a

child who exhibits a throat-clearing tic might practice regulated or relaxed breathing (i.e., breathing in through his nose and out through the mouth) upon becoming aware of a tickling sensation in his throat. The same child might bring his hands to his side or cross his arms in response to an arm-jerking tic. Three rules, however, are common to all competing responses: (1) The chosen response must be opposite to that of the targeted behavior; (2) It must be maintained for 1 minute or until the urge to pull or tic subsides (whichever is longer); and (3) It should be socially inconspicuous. Children are taught to initiate their competing response upon identifying either a warning sign for the targeted behavior (ideally) or the targeted behavior itself (i.e., hair pulling, throat clearing, etc.). In the latter example, the third component to simplified HRT, social support, may be critical.

The **social support** component to simplified HRT consists of identifying a family member (most typical) or friend to provide encouragement and support in the child's use of their competing response. Specifically, the social support person (or the entire family, if deemed more appropriate) is instructed to praise the child when (s)he practices using their competing response. The social support person is also asked to remind the child, in a non-pejorative manner, to use the competing response when he/she fails to detect an occurrence of the targeted behavior (i.e., "Don't forget to use the exercises that Dr. Smith showed you."). Although research suggests that the social support component to HRT may not be essential for adults,³⁹ it is generally considered an important component to treatment for children.

Empirical Evidence Supporting HRT for the Treatment of Repetitive Behavior Disorders

A substantial body of research utilizing single subject research designs and a growing body of randomized controlled trials support the efficacy of HRT for the treatment of both tic disorders and trichotillomania (see below). The components to HRT, however, do not differ significantly whether the treatment is administered to children or adults though, as described above, use of the social support component may be less important for adults. As a result, the studies described below include empirical evidence from studies among both child and adults populations. These studies generally recruit participants with tic disorders or trichotillomania (not both). As a result, the following section is partitioned accordingly.

Tic Disorders

Carr & Chong⁴⁰ reviewed 20 studies that collectively treated over 100 individuals with tics using HRT and found the procedure to be generally effective. Although methodological shortcomings limited conclusions from this examination, the authors acknowledged HRT as "probably efficacious" according to guidelines outlined by the Task Force on Promotion and Dissemination of Psychological Procedures (1995).⁴¹

Azrin and Nunn³⁴ conducted the first examination of HRT for the treatment of patients engaged in hair-pulling, nail-biting, and thumb sucking, as well as individuals suffering from tics. Although important methodological limitations are noteworthy (i.e., self-report as the sole dependent measure, lack of a comparison group), results demonstrated that HRT was effective in completely eliminating these repetitive behaviors in 83.3% (10/12) of patients. In a subsequent study, Azrin and Peterson⁴² randomly assigned 14 participants with TS to HRT or wait-list condition. Tic-frequency was measured via videotaped observation (rather than patient self-report). At 12-month follow-up, the authors noted 89% and 92% reductions in tics in the clinic and home, respectively. Patients in the wait-list condition demonstrated no treatment benefit at 3-month follow-up, were offered HRT, and, by the end of treatment, demonstrated similar reductions in tic frequency to those in the experimental condition. A larger study compared HRT to wait-list control among 47 participants with chronic tic disorders.⁴³ At 4-month follow-up, participants in the HRT condition reported significant (75-100%) control over their tics. More recently, Wilhelm et al.⁴⁴ compared

HRT to supportive psychotherapy for individuals with TS and found that HRT produced significantly greater improvement than supportive psychotherapy. At post-treatment, those in the HRT condition demonstrated a 35% reduction in tic severity compared to a 1% increase in tic severity among those in the supportive condition. These results suggest that treatment-specific factors implemented in HRT are likely responsible for the change. Discrepancies in treatment effects across studies are likely due to variations in methodology (i.e., stringency of research design, outcome measures, etc.).

Trichotillomania

Although treatment outcome research for trichotillomania is generally considered to lag far behind that of other psychiatric disorders (even tic disorders), recent adult research suggests that CBT is superior to wait-list,^{45, 46} pharmacotherapy,^{46, 47} pill placebo,⁴⁷ and supportive therapy.⁴⁸ As described above, HRT represents a core component to these tested CBT treatment packages. Additionally, a recent meta-analysis by Bloch and colleagues⁴⁹ found that HRT was superior to pharmacotherapy with clomipramine for the treatment of adults with the disorders. In contrast, there is some limited evidence from single subject experimental designs³⁷ and one open-label CBT trial as to the efficacy of HRT for pediatric trichotillomania.²⁵ Because (1) the basic components of CBT are thought to be analogous when comparing the treatment of children and adults and (2) there are no published, well-controlled studies of CBT for children with trichotillomania, I provide a brief overview of CBT for adults. Later in this paper, I will discuss the lone open-trial of CBT among this population (see CBT Solidifies its Case as a Viable Treatment Option).

van Minnen et al.⁴⁶ compared CBT to fluoxetine and a wait-list control for individuals diagnosed with trichotillomania and found significantly greater reductions in hair-pulling for those treated with HRT compared to fluoxetine or wait list. In another study, Mouton and Stanley⁵⁰ examined the effectiveness of group delivered CBT with five adult hair pullers. They found that CBT was effective in reducing the severity of hair pulling at post-treatment and that treatment gains were maintained at one-month for three of the participants and at six months for two of the participants. More recently, however, group-based CBT for trichotillomania has not demonstrated similarly positive results.⁴⁷ In a review of available treatments for trichotillomania, Elliott and Fuqua³² concluded that HRT was the most effective behavioral treatment for the disorder, although they acknowledged the need for further well controlled outcome studies. In a unique look at the social validity of HRT as a treatment for trichotillomania, Elliot and Fuqua⁵¹ distributed several vignettes to college students and found HRT to be a more acceptable form of treatment than hypnosis, medication, or punishment. Although the study was an analogue study using college students, the results nonetheless support that HRT may be a socially valid treatment option for TTM.

Collectively, these findings highlight the potential efficacy of CBT, with HRT often employed as a core component to treatment, for trichotillomania, tic disorders, and repetitive behavior disorders. This summary also highlights the limitations to existing research. For example, to date, only one moderate-sized open-trial of CBT for childhood trichotillomania exists.²⁵ For CBT to gain widespread use and recognition as a viable alternative to pharmacological interventions large scale, randomized controlled trials are necessary to confirm the results of the preliminary studies described above. Recently, researchers have begun to address these limitations. Below, I describe two recent studies and impending lines of research that, to varying degrees, may help to dramatically impact how CBT (as an alternative or adjunct to psychotropic medication) is viewed by child psychologists, psychiatrists, and pediatricians.

CBT Solidifies its Case as a Viable Treatment Option for Repetitive Behavior Disorders

A recent paper published in the *Journal of the American Medical Association* demonstrates the potency of CBT for the treatment of tic disorders. Piacentini and colleagues⁵² compared the efficacy of an 8-session, comprehensive behavioral intervention for tics that included a function-based intervention, HRT, psychoeducation, relaxation training, and a behavioral reward program to psychoeducation supportive therapy. One hundred and twenty six children diagnosed with either TS or a chronic tic disorder was randomized to either this behavioral intervention or supportive therapy across three treatment sites (i.e., University of Wisconsin-Milwaukee, University of California-Los Angeles, and Johns Hopkins University). Results demonstrated that the behavioral intervention led to a significantly greater decrease in tic severity from baseline to follow-up. Significantly more children receiving the behavioral intervention were rated as being very much improved or much improved by an independent evaluator. Of critical importance, few families (9.5%) withdrew from the study or reported worsening of symptoms (4%). In total, 87% of available treatment responders continued to exhibit benefit from the behavioral intervention at 6-month follow-up. These results provide the strongest support to date regarding the efficacy of behavior therapy for the treatment of tic disorders.

Only one study has sought to examine the efficacy of CBT for childhood trichotillomania utilizing anything more than single-subject research design methodology. Tolin, Franklin, Diefenbach, Anderson, and Meunier²⁵ conducted an open-label CBT trial (i.e., HRT, self-monitoring, stimulus control, and cognitive restructuring) with 22 child hair pullers. Children participated in 12 sessions of CBT (8 weekly sessions + 4 bi-weekly relapse prevention sessions). Although limited by the lack of a comparison group, results from this study were encouraging and demonstrated that an independent evaluator classified 77% and 66% of children as treatment responders at post-treatment and 6-month follow-up, respectively. Clearly, this study's findings are preliminary and require replication. However, this study is the first comprehensive CBT protocol ever developed for children with trichotillomania. The first and second authors have subsequently published a treatment manual based upon the CBT protocol utilized in this study. Subsequent to this study's completion, the second author (Martin E. Franklin, Ph.D.) procured funding for a treatment development grant from the National Institute of Mental Health (NIMH, R21) to pilot test this CBT protocol utilizing a randomized controlled design. Results will soon be published and are quite promising. Based upon the results of this treatment development grant, Dr. Franklin has received funding from the NIMH (R01) for a large-scale, randomized controlled trial of CBT compared to psychoeducation supportive therapy for the treatment of childhood trichotillomania. In sum, a growing body of evidence is accumulating suggesting that CBT is a viable treatment option for children with trichotillomania. Of note, there are no empirical evidence supporting the efficacy of any pharmacological intervention for the treatment of children with this disorder.

Future Research Directions/Conclusion

A substantial body of literature has accumulated pointing to the efficacy of CBT for childhood repetitive behavior disorders. In particular, HRT seems to be at the core of most of these interventions. However, much research is still needed. For example, the study by Piacentini and colleagues⁵¹ must be extended to provide a more direct comparison of behavior therapy to pharmacological interventions for the treatment of tic disorders. Research examining potential predictors or moderators of treatment is also needed. The findings by Tolin and colleagues²⁷ are encouraging but require replication and extension. Although this work is currently underway, independent recruitment sites and researchers

must also take part in this level of examination. Akin to work in childhood OCD, empirical investigations should compare CBT alone, medication alone, and combination therapy (i.e., CBT + medication) to placebo (or a stronger control condition) for the treatment of hair pulling in children. Unfortunately, CBT, in particular HRT, is not well-known or utilized in the general community. As a result, researchers must better disseminate efficacious cognitive-behavioral interventions to better serve those children and their families afflicted with these sometimes debilitating disorders.

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