Published in final edited form as:

Clin Case Stud. 2016 December ; 15(6): 459–475. doi:10.1177/1534650116669431.

Cognitive-Behavioral Therapy for a 9-Year-Old Girl With Disruptive Mood Dysregulation Disorder

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Abstract

Disruptive mood dysregulation disorder (DMDD) is a relatively new diagnosis in the field of childhood onset disorders. Characterized by both behavior and mood disruption, DMDD is a purportedly unique clinical presentation with few relevant treatment studies to date. The current case study presents the application of cognitive-behavioral therapy (CBT) for anger and aggression in a 9-year-old girl with DMDD, co-occurring attention deficit hyperactivity disorder (ADHD), and a history of unspecified anxiety disorder. At the time of intake evaluation, she demonstrated three to four temper outbursts and two to three episodes of aggressive behavior per week, in addition to prolonged displays of non-episodic irritability lasting hours or days at a time. A total of 12 CBT sessions were conducted over 12 weeks and 5 follow-up booster sessions were completed over a subsequent 3-month period. Irritability-related material was specially designed to target the DMDD clinical presentation. Post-treatment and 3-month follow-up assessments, including independent evaluation, demonstrated significant decreases in the target symptoms of anger, aggression, and irritability. Although the complexities of diagnosing and treating DMDD warrant extensive research inquiry, the current case study suggests CBT for anger and aggression as a viable treatment for affected youth.

Keywords

DMDD; ADHD; age group; pediatric/child; cognitive-behavioral therapy (CBT); aggressiveness/aggression

1 Theoretical and Research Basis for Treatment

Anger, aggression, and irritability in youth are associated with various clinical diagnoses, including attention deficit hyperactivity disorder (ADHD), oppositional defiant disorder (ODD), and depression (G. A. Carlson, Danzig, Dougherty, Bufferd, & Klein, 2016; Stringaris, 2011; Sukhodolsky, Smith, McCauley, Ibrahim, & Piasecka, 2016). A more recent diagnostic category now exists that also captures these symptoms: disruptive mood

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Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

dysregulation disorder (DMDD; American Psychiatric Association [APA], 2013). DMDD is a childhood onset disorder characterized by at least three severe temper outbursts per week with distress that is disproportionate to emotional triggers. Furthermore, mood between these outbursts is disrupted, with children presenting as irritable or angry at least 50% of their waking hours. To meet criteria for the diagnosis, irritability symptoms should be present for at least 12 months without symptom-free intervals longer than 3 months. DMDD has significant overlap with symptoms of both disruptive behavior and mood disorders (Dougherty et al., 2014; Mayes, Waxmonsky, Calhoun, & Bixler, 2016), leading to contention as to whether or not DMDD is truly a distinct diagnostic category (Noller, 2016; Runions et al., 2016; Wakefield, 2013). Nevertheless, the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM-5*; APA, 2013) includes DMDD as such (APA, 2013; Roy, Lopes, & Klein, 2014), thus warranting further research on related assessment and treatment.

Children and adolescents with DMDD may benefit from behavioral interventions for anger and aggression. A large evidence base exists for cognitive-behavioral therapy (CBT) as a treatment for anger and aggression (Sukhodolsky, Kassinove, & Gorman, 2004). Because anger outbursts, angry mood, and aggression are the core symptoms of DMDD, CBT may also be useful for children who meet diagnostic criteria for this newly characterized disorder.

Treatment studies related to DMDD are rare, despite converging evidence that DMDD may be common among clinic-referred youth (Freeman, Youngstrom, Youngstrom, & Findling, 2016) and stable throughout childhood development (Mayes et al., 2015). Two studies have demonstrated some effectiveness of treating concurrent ADHD and disruptive mood symptoms in children (Baweja et al., 2016; Blader et al., 2016). One randomized controlled trial (RCT) to date has examined psychotherapeutic treatment effectiveness, specifically for youth with psychostimulant-medicated ADHD and an earlier diagnostic iteration of DMDD, known as severe mood dysregulation (SMD; Waxmonsky et al., 2015). The treatment program, ADHD plus Impairments in Mood (AIM), drew from extant CBT, behavioral parent training (BPT), and problem-solving models to target children's awareness of and responses to mood dysregulation. Irritability symptoms were measured by the three items (temper loss, angry or sad mood, and hyperarousal) on two clinical parent interviews that focus on disruptive behaviors in children: the Washington University of St. Louis Kiddie Schedule for Affective Disorders and Schizophrenia (WASH-U-KSADS; Geller et al., 2001) and the Disruptive Behavior Disorders Structured Parent Interview (DBD-I; Hartung, McCarthy, Milich, & Martin, 2005). Disruptive behaviors were shown to significantly decrease in the experimental treatment versus an active control, whereas effects on the measured mood symptoms were not significant. Temper outbursts decreased during the course of treatment but were reported to substantially increase during treatment follow-up phase. Overall, the study indicates that behavioral interventions built from CBT and parent management training (PMT) principles may be helpful in youth with DMDD, though time-limited booster sessions may be warranted to maintain treatment benefits.

Many questions regarding the treatment of DMDD in children remain, especially in an individual therapy format. The present case study allows for an initial exploration of

specially tailored CBT for anger and aggression (Sukhodolsky & Scahill, 2012) as a viable treatment for a child with DMDD.

2 Case Introduction

“Bella” was a 9-year-old Hispanic girl whose mother enrolled her in our RCT for youth with anger and aggression (Sukhodolsky, Vander Wyk et al., 2016). This ongoing RCT subscribes to a Research Domain Criteria (RDoC) approach by identifying dimensions of behavior and related neural markers that are not confined to specific diagnostic categories (Cuthbert, 2014). Thus, Bella’s presentation of multiple diagnoses (explained below) complemented a trans-diagnostic approach to treating a broader spectrum of irritable behavior. Following assessment protocol, Bella was randomly assigned to CBT treatment (as opposed to supportive psychotherapy).

3 Presenting Complaints

Bella’s mother sought treatment due to increasing disruptive behaviors over the past year, including non-compliance at home and at school, physical aggression toward peers, and frequent behavioral meltdowns which resembled the temper tantrums of a much younger child. Tantrums included screaming, yelling, slamming doors, and crying. Triggers could include being asked to take her daily medication or feeling that someone was standing too close to her. Bella and her mother both noted that it was difficult for Bella to “move on” when something angered her. She also noted that Bella had an underlying irritable mood, manifesting as Bella appearing “cranky” the majority of the time and the family feeling they needed to “walk on eggshells” to avoid upset. Bella was at risk for suspension from her sports teams due to recurrent unprovoked aggression toward her teammates. At school, at least one phone call home per week was being placed due to Bella’s refusal to comply or sometimes to even speak to her teacher for days at a time. Bella and her mother noted that Bella was generally well liked by peers and teachers, given that she was hardworking and funny, yet her current disruptive behaviors were causing significant interference in making new friends and meeting academic goals.

4 History

Bella lived with her mother, stepfather, and three older siblings. She visited with her father who lived nearby approximately once per month. Bella’s mother denied any pre- or perinatal complications and stated that Bella met developmental milestones on time. Behavioral difficulties reportedly began around age 3, where Bella’s mother noted that she was extremely active and markedly stubborn. These concerns were exacerbated in the school setting and, by age 6, Bella participated in a pediatric evaluation that yielded a diagnosis of ADHD-Combined presentation due to ongoing difficulties with inattention and hyperactivity that were impeding her academic performance. Bella’s history was further complicated by persistent difficulties with math and related anxiety about math performance. These combinations of symptoms led to the provision of a school 504 plan that afforded Bella intensive math support, extra time on tests, and classroom breaks, as needed. At the time of intake, Bella was attending fourth grade in mainstream classes and described herself as

doing well in school, save for assignments in math assignments which remained her least favored subject.

Bella had not participated in any form of psychological treatment prior to participating in our treatment study. Bella was prescribed Stratera (18 mg/day) at age 7 by her pediatrician, which was maintained at the time of our intake interview and throughout treatment. In our study, we include participants with either no medication or stable medication regimens, though medication management is not provided. Stratera is a brand name version of atomoxetine, a selective norepinephrine reuptake inhibitor. Although psychostimulant medication is generally recommended as the first-line treatment for ADHD in children (Blader et al., 2016), there are sometimes reasons for prescribing alternative medications such as atomoxetine (Pliszka, 2007). According to Bella's mother, at age 7, Bella presented with mild anxiety, particularly related to school performance. Comorbid anxiety has been observed in 25% to 35% of children diagnosed with ADHD, and atomoxetine is accepted as effective with this dual diagnosis (Hammerness, McCarthy, Mancuso, Gendron, & Geller, 2009). Overall, this relatively low dose of medication had reportedly proven useful in addressing both anxiety and ADHD symptoms for Bella and, according to our team's psychiatry consultants, was appropriate for progressing with therapy without psychiatric re-evaluation.

Our study does not provide medication management or consultation regarding medication that children are receiving in the community. Children are eligible to participate if medication has been stable without plans for change for the 4-month study period. We generally only recommend psychiatric evaluation or re-evaluation for ADHD symptoms if these symptoms are clearly an underlying factor in the participant's anger and aggression, or if symptoms grossly affect the participant's ability to understand the material or engage in treatment. Neither of these descriptions applied to Bella, who met criteria for ADHD diagnosis based on clinical interview and was in the borderline clinical range on parent report measures ($T = 68$ on the Attention Deficit/Hyperactivity subscale of the Child Behavior Checklist [CBCL]; Achenbach & Rescorla, 2001), but whose symptoms appeared relatively non-impairing at the time of intake.

5 Assessment

As part of the study, Bella and her mother were administered comprehensive assessments of irritability and associated psychopathology, including clinical interviews and parent report measures. With Bella's assessment, we maintained adherence to the study protocol, which only required participation of one parent. However, we would have been happy to obtain information from Bella's father or engage him in the study process if it had been requested by the family. In addition, Bella and her mother stated that behavior presentation was largely similar across the two households.

Diagnostic Interview

DSM-5 diagnoses were assigned based on the structured interview conducted by an experienced clinical psychologist (last author). The Kiddie Schedule for Affective Disorder and Schizophrenia for School-Age Children, Present and Lifetime (K-SADS-PL; Kaufman

et al., 1997) is a diagnostic interview that assesses psychopathology in children based on child and parent report. Interview questions are presented to both children and parents separately, followed by integration of both informants' report. DMDD symptoms were evaluated by the K-SADS addendum (Leibenluft, 2011). DMDD symptoms are coded as "Not present," "Sub-threshold," or "Threshold" for *DSM-5* diagnostic criteria. At the time of the interview, Bella's prior diagnosis of ADHD-Combined presentation was confirmed due to impairing symptoms of inattention, distractibility, and hyperactivity, though these symptoms were reportedly significantly decreased and minimally impairing since medication prescription at age 7. Her preexisting community diagnosis of unspecified anxiety disorder was not confirmed with K-SADS; both Bella and her mother reported occasional bouts of worry about school performance but not to the frequency or intensity that warrants clinical diagnosis.

DMDD

Per the K-SADS, Bella and her mother shared that Bella typically presented with out-of-control 30-min temper outbursts approximately 3 to 5 times per week. Outbursts consistently appeared out of proportion to the situation at hand and reportedly resembled that of a much younger child, around 3 to 4 years old. Outbursts consisted of screaming, crying, insulting others, and general non-compliance occurring at home and, less often, in the community (e.g., in the grocery store, at the sidelines of a soccer match). In between outbursts, Bella's mood was described as generally "cranky" and her mother described feeling that she was "walking on eggshells" around Bella. Bella's mother shared that this irritability occurred approximately 75% of the time, with Bella appearing neutral or cheerful the remaining 25% of each day. Bella's persistently angry and irritable presentation was not only endorsed by her mother but also her elder siblings, teacher, and soccer coach. Opposition and defiance were noted since age 3; however, the outbursts and irritability described here had manifested for approximately 2 years preceding assessment (since age 7). The longest symptom-free period was as a few days, and such bouts were reportedly rare. Overall, symptoms were described as causing impairment for Bella in her family relationships, friendships, and school performance. The obtained symptom profile, in addition to the absence of past or current mania, warranted a diagnosis of DMDD. Of note, Bella also met criteria for ODD; however, a diagnosis of DMDD contraindicates ODD diagnosis (APA, 2013).

Of note, we do not collect teacher ratings as part of study assessment procedure, although sometimes families bring copies of past assessments that include teacher ratings. However, in clinical settings, it is advisable to collect teacher ratings of ADHD as well as symptoms of other behavioral and mood disorders. For example, clinicians could seek out teacher report versions of the parent report measures described below, to then be integrated into the clinical assessment. Further information gathering can include discussion of core DMDD symptoms with teachers or other school professionals in order to better understand presentation of these symptoms across multiple settings.

Parent Report Measures

Bella's mother filled out a battery of parent report measures. Scores on the measures of anger/irritability and aggression are presented in Table 1. The 18-item CBCL–Aggressive

Behavior subscale (Achenbach & Rescorla, 2001) was completed as a “gold standard” measure of aggressive behavior and yielded a clinically elevated score for Bella. The Affective Reactivity Index (ARI; Stringaris et al., 2012) consists of seven items, six of which are averaged as an index of irritability. Youth with SMD were reported to have an average score of 7 on this measure. As such, Bella’s score of 10 reflected clinical elevation. The Disruptive Behavior Rating Scale (DBRS; Barkley, 1997) is an eight-item measure keyed to the DSM symptoms of ODD. A mean DBRS score of 12 and above indicates clinically significant symptoms, and Bella’s score of 13 was above this clinical threshold. Parent ratings of depression and anxiety conducted per the Child Depression Inventory (Kovacs, 2011) and the Multidimensional Anxiety Scale for Children (March, 2012) indicated that Bella was experiencing normative levels of internalizing symptoms. Together, these parent ratings indicated that Bella’s particular presentation of DMDD was characterized by externalizing behaviors and irritability, rather than depressive mood.

Aggression

Aggressive behavior was measured using the Modified Overt Aggression Scale (MOAS; Silver & Yudofsky, 1991; Yudofsky, Silver, Jackson, Endicott, & Williams, 1986) tailored to the assessment of aggression in clinical trials (Blader, Schooler, Jensen, Pliszka, & Kafantaris, 2009). The MOAS was administered as an interview with the parent and child (separately) by an independent evaluator (licensed clinical social worker) who was not involved in treatment and was unaware of the treatment that Bella was receiving. The MOAS is used as a primary outcome measure in the relevant clinical trial (Sukhodolsky, Vander Wyk et al., 2016) and consists of 16 items related to the aggressive behavior over the past week. Items are weighted based on potential harm and create four aggression subscales, including Verbal Aggression, Aggression Against Objects, Self-Directed Aggression, and Aggression Against Others. Bella evidenced significant levels of aggressive behaviors in all subscales excepting for self-directed aggression, resulting in an overall score of 32. For example, Bella was reported as presenting with three aggressive incidents (e.g., punching) toward non-relative peers in the week preceding evaluation.

Target Symptoms

In addition to the MOAS, the independent evaluator also elicited the two most pressing concerns in the area of anger and aggression and described these concerns, which are referred to as “target symptoms.” Target symptoms are coded in terms of frequency, duration, severity, and impact on adaptive functioning across all contexts (McGuire et al., 2014). Bella’s target symptoms were (a) anger outbursts and meltdowns, characterized by verbal aggression and subsequent “shutting down,” with refusal to comply or communicate, and (b) physical aggression, such as hitting, punching, and shoving which most commonly occurred toward sports teammates, classmates, and her older brother.

Intellectual Functioning

Per study protocol, Bella completed the Wechsler Abbreviated Scale of Intelligence (WASI), indicating a verbal IQ of 93, a performance IQ of 99, and a full-scale IQ of 96. Overall, this intellectual functioning screener suggested that Bella’s intelligence was uniform across abilities and fell in the *Average* range of functioning. These results indicated that Bella

would be a good candidate for the CBT content and activities (Lickel, MacLean, Blakeley-Smith, & Hepburn, 2012).

6 Case Conceptualization

Bella, like many youth with ADHD, exhibited disruptive behavior concurrent with inattention and hyperactivity symptoms (C. L. Carlson, Tamm, & Gaub, 1997). Although pharmacological treatment significantly decreased Bella's school difficulties by age 7, anger and aggression persisted. Evidence suggests that children like Bella may possess an inherent predisposition for irritability, including impaired functioning in the amygdala and frontal lobe (Vidal-Ribas, Brotman, Valdivieso, Leibenluft, & Stringaris, 2016). Her early onset of irritable behavior and aggression may have resulted in teachers and family members responding in an inadvertently reinforcing manner, for example, separating Bella from other children versus problem solving. Thus, Bella's clinical profile reflected both a predisposition to disruptive behavior and an interaction with her environment that resulted in interference with developmental maturation of emotion regulation or social skills that were expected for her age. In addition to disruptive behaviors, Bella has also experienced some academic difficulties, particularly in the area of math. Academic performance became a source of anxiety which further compounded non-compliance with homework and behavioral problems at school. As such, Bella had learned from a young age to primarily communicate her negative emotions through avoidance, physical aggression, and tantrums, which were reinforced by Bella's attainment of desired goals (e.g., a child going away or obeying her demands, family offering her several hours of personal space). Alone, these behaviors would have warranted a diagnosis of ODD. For Bella, however, her prolonged instances of angry and irritable mood in between temper outbursts indicated a diagnosis of DMDD. It is also important to note that early onset of ADHD and co-occurring symptoms of anxiety are also consistent with the diagnosis of DMDD (Dougherty et al., 2014; Mulraney et al., 2015; Uran & Kılıç, 2015).

Although Bella demonstrated many strengths, such as athletic ability and sense of humor, many of her social experiences became overshadowed by negative interactions, which were interfering with her enjoyment of home and school life. As such, our treatment goal was to replace Bella's maladaptive anger outbursts and aggressive behaviors with age-appropriate skills of managing frustration and communicating with others. Simultaneously, Bella's mother was taught parenting tools for supporting Bella's progress in learning of new emotion regulation and problem-solving skills.

7 Course of Treatment and Assessment of Progress

Bella and her mother were seen by a post-doctoral clinical psychologist (first author) for 12 weekly 60-min CBT sessions. Then, she participated in five booster sessions over the subsequent 3 months. Our program typically offers three booster sessions; however, additional booster sessions were requested by the family to maintain treatment gains. We agreed to provide extra boosters because in a recently published study of behavioral intervention for children with SMD, immediate irritability-related treatment gains were not maintained at 6-week follow-up (Waxmonsky et al., 2015). Manualized CBT for anger and

aggression in youth was administered using a structured treatment manual (Sukhodolsky & Scahill, 2012). The treatment is organized into three modules: emotion regulation, social problem solving, and social skills.

After each session, children received a therapeutic homework, which is referred to as “anger management practice” with the child to avoid using the word *homework*. As part of this practice, children are asked to fill out an anger management log, different for each session, which asks for specific examples of using each skill discussed in the last session in the context of an angry or aggressive outburst, whether anger management strategies were implemented successfully or unsuccessfully. Completion of anger logs is rewarded at the next session with enthusiastic praise from the therapist and small prizes when developmentally appropriate. Parenting skills are also integrated into treatment and coached during additional parenting sessions.

The manual includes built-in flexibility features that allow the child and the therapist to select therapeutic techniques and activities that match the child’s developmental level and target symptoms. Additional material was integrated that focused on DMDD-specific symptoms (described further below). Progress was assessed through the battery of interview and parent report measures described previously, which were conducted before and after treatment, and following a 3-month “booster” phase. Treatment progress was also discussed at weekly check-ins with Bella’s mother about the form, frequency, duration, and intensity of Bella’s target symptoms (i.e., temper outbursts, physical aggression).

Emotion Regulation and Anger Management

Sessions 1 to 3 involved an introduction to therapy, psychoeducation, identification of anger triggers, and the development of strategies to prevent anger episodes, such as scripting verbal reminders and relaxation training. Bella responded well to this phase of treatment and was particularly impressed that there were alternative approaches to handling angry behaviors. She stated that she was unaware that anger could be changed. Bella’s anger triggers typically included the perception that peers or family members had wronged her and the desire to “teach them” it was not okay through yelling or aggression. For example, immediately preceding the first session, Bella had punched a basketball teammate for “putting her hands on” her. Bella’s mother confirmed that the girl had simply brushed against Bella while walking by her. Bella took to silently singing a popular song lyric, “Stop! Wait a minute!” in her mind when recognizing an anger cue or early signs of anger escalation (e.g., a 1 or a 2 on her 5-point anger thermometer), and then engaging in deep breathing or reciting verbal reminders to guide her behaviors, such as, “You are going to get in trouble” or “Maybe this isn’t something to get worked up over.” Each week, Bella earned small prizes (e.g., shopkins) for completing anger management practice logs that described her handling of an anger-provoking episode.

Social Problem Solving

Sessions 4 to 6 covered social problem-solving skills including problem identification, generating different solutions, and evaluating the possible consequences to reduce conflict. Identifying the differences between responses that are *passive*, *assertive*, or *aggressive* was

especially useful in enhancing Bella's ability to generating solutions to conflicts. The therapist helped Bella and her mother to collaborate on developing behavioral contracts to prevent specific conflicts at home. For instance, Bella initially presented with a 5- to 10-min anger outbursts approximately 5 times per week when asked to take her medication. This occurred despite the fact that Bella's mother did not alter the request and, ultimately, Bella took her medication successfully each time. In treatment, Bella agreed to calmly and immediately take her medication each night and her mother agreed to take her to get doughnuts every Saturday based on that behavior. Subsequently, Bella's tantrums regarding medication decreased to 0 within 2 weeks and maintained for the several subsequent months of treatment.

Bella also excelled at decreasing her hostile attribution bias by reframing her previously negative perceptions of others' intentions. She recognized that many past incidents where she believed that people were attempting to bother or assault her were misunderstood. Bella showed pride in her new ways of handling these situations, making statements like, "People want to be my friend more now. They used to think I was cool but kind of crazy. Now they just think I am cool."

Social Skills

Sessions 7 to 9 addressed social skills for preventing and resolving conflicts or anger-provoking situations with siblings, peers, teachers, and family. Potential solutions to conflicts were role-played in session, for example, acting out how to calmly handle disagreements with friends about what to play or how to politely ask her brother to stop teasing her. For example, when playing with others, Bella practiced asking for the opinions of her friends, like, "Would you all like to play it this way?" rather than insisting that they play her way at the beginning of a play session (e.g., "I'm in charge, I don't care if you don't like it"). These skills were practiced in session with her therapist playing the part of other children who may disagree, which was effective in escalating anger and allowing for practice of positive interactions. Monitoring of voice tone and facial expression was exercised through the use of video recording, thereby helping Bella monitor and modify her outward expression of anger. Bella agreed that these skills contributed to more positive play time and more fun with her friends, which she noted as a more important goal than getting her way.

Importantly, Bella practiced simply stating, "I need help" or "I need a break" when feeling upset, rather than using harsh words or physical aggression. Her teacher and family reinforced this effective communication by calmly and briefly discussing the situation at hand, problem solving, and allowing Bella some alone time, as needed. These communication skills were integral in decreasing aggression, as Bella felt that she had a new tool for resolving social problems that did not put her at risk for getting in trouble (unlike punching others).

Parent Training

Parents are an integral component in CBT for anger and aggression (Sukhodolsky & Scahill, 2012). Three separate 60-min sessions were conducted with Bella's mother to address

family conflict and provide strategies for encouraging positive behaviors such as giving praise, attention, and privileges. This duration of sessions was sufficient with Bella's treatment, although more flexibility may be required in other cases. The treatment manual suggests conducting parent sessions in conjunction with the first, middle, and final CBT sessions, though flexible administration is often required due to family scheduling needs and to ensure that parent training coincides effectively with CBT sessions. Treatment progress and skills covered in each CBT session were also reviewed with the parent at each visit so that parents could track and reward application of new anger management skills at home. These parenting skills were especially important to Bella's progress, given that she was growing up in a household with multiple siblings and expected behaviors often went unnoticed, whereas misbehavior resulted in one-on-one attention. In parenting sessions, the converse response was practiced with Bella's mother, wherein "shut down mode" or yelling received no attention, whereas Bella's problem solving and use of other coping strategies received praise and encouragement.

School Consultation

To maximize treatment gains in the school setting, Bella's therapist had intermittent phone conversations with Bella's fourth-grade schoolteacher. Target behaviors (e.g., decreasing aggression, increasing compliance) and related strategies (e.g., Bella's recognition of anger cues, practicing effective communication in place of aggression) were relayed to Bella's teacher, who was eager to encourage Bella's progress in the school setting through prompting and praise. Bella's teacher provided invaluable insight into behavioral progress, including report that Bella's decrease in irritable behaviors made her more amenable to math tutoring. Subsequently, Bella arrived to several sessions sharing about success with math during the previous week.

Adapting Treatment for DMDD

Although much of the extant CBT treatment manual was appropriate for addressing Bella's target behaviors of aggression and tantrums, some specialized material was integrated into Bella's care to target the prolonged periods of irritability she demonstrated at home, school, and, sometimes, in the therapy session. These adaptations included (a) extending psychoeducation, (b) emphasizing on behavioral activation, (c) building an emotion regulation template for reducing duration of irritable mood periods, and (d) including extra booster sessions during the 3-month booster period (five instead of the usual three sessions). Psychoeducation included characteristics of prolonged irritable episodes, such as specific triggers, the common feeling of being "stuck" in that mood, and creating a creative metaphor for the irritable mood. Bella described her prolonged irritable episodes as "shut down mode" wherein her brain withdrew and could only react "in a snappy way" toward others. This allowed Bella to quickly identify irritability and remind herself that it was possible to coach her brain to "reverse shut down mode" where she could enjoy herself and interactions with others.

Behavioral activation was used to reduce prolonged periods of negative mood (e.g., Pass, Whitney, & Reynolds, 2016). Specifically, Bella maintained a list of enjoyable activities she could do in any setting to help herself keep active and busy, which, in turn, reduced the

intensity of her “shut down mode” and increased her chances of being happy. For example, she would read, watch television, or ask family members to play with her during these instances. Prior to treatment, when in “shut down mode,” she was most likely to retreat to her room and dwell on the situation that triggered her anger.

Last, although decreasing irritability was an important goal, it was also recognized that some occasional irritable mood is typical, especially after a child is particularly disappointed or frustrated. As such, Bella and her mother collaborated with the therapist to identify a goal for the form and duration of irritable behavior. Specifically, Bella decided that 20 min of alone time, which she would request of her family calmly, would be sufficient to take part in a fun activity and help her “move on,” to which her mother agreed. These skills were especially relevant during the booster sessions of therapy, likely because tantrums and aggression had significantly decreased and “shut down mode” became a more pressing behavioral concern.

Post-Treatment Assessments

All outcome data are presented in Table 1. Bella’s improvement was assessed following 12 sessions of CBT (and also at follow-up, presented in the “Follow-Up” section below). All post-treatment measures indicated a significant decrease in anger/irritability and aggression and fell within the normative range of functioning.

MOAS score reduced from 32 to 2, demonstrating that Bella had exhibited zero instances of verbal or physical aggression in the past week, and only one instance involving property damage: slamming a door when asked to clean her room before watching a movie. At that time, her mother noted that “shutting down” occurred once during the past week and was disruptive to family activities. As such, this behavior was targeted in later booster sessions.

The independent evaluator assigned a Clinical Global Impression-Improvement (CGI-I) score as a primary categorical outcome measure in the present research study (Arnold et al., 2003). This score indicates the level of behavioral change from baseline rated on a 7-point scale (1 = *very much improved*; 7 = *very much worse*). Bella’s target symptoms of decreasing meltdowns and decreasing physical aggression were rated as 1 “*very much improved*.”

8 Complicating Factors

Bella’s irritability served as a mildly complicating factor in two treatment sessions (Session 5 and a booster session). Specifically, irritability and opposition presented to a degree that limited Bella’s engagement in session material. In both occurrences, Bella was angered by something that occurred prior to session and initially refused to speak to her therapist. Although these instances were challenging in terms of completing planned session material, they were recognized as inherent to Bella’s target symptoms and, ultimately, helpful in exercising *in-vivo* practice of emotion regulation skills. Fortunately, Bella and her therapist were always able to end these sessions on a positive and meaningful note by offering validation and clear contingencies that both modeled and rewarded behavior activation (e.g., “I’m sorry to see you are having a rough day, Bella. When you are ready to talk, let me

know. I want to ask you one question about the past week and then I have a very funny video to show you!”). These potentially complicating factors are especially important for the consideration of students and professionals, and are addressed further in “Recommendations to Clinicians and Students” section.

9 Access and Barriers to Care

It is important to note that the current treatment was conducted as part of a research study and, thus, may not reflect the typical clinic environment. As part of the study, the family received free clinical services, monetary compensation for their time, and flexible scheduling options. These characteristics of the study likely lessened the burden of participation for the family, who did not report any significant difficulties with completing all study visits. A family of a child referred to an outpatient clinic for a similar treatment would be responsible for the treatment cost, without compensation for time dedicated to assessment and treatment, which could limit some families’ ability to access and complete treatment.

10 Follow-Up

Bella participated in five booster sessions over the course of 3 months, immediately following the completion of the standard 12 CBT sessions offered as part of our research study. These sessions were designed to review and reinforce the content of the therapy program and to identify ongoing areas of need. These sessions are administered once per month on average, although in Bella’s case, we added two additional sessions to address DMDD symptoms. In Bella’s case, these boosters were useful for check-ins regarding irritability and behavioral activation skills, which were relevant to the remaining behavioral goals at that time. Our study typically offers three booster sessions for families but, given past evidence that suggests the utility of follow-up sessions for youth with DMDD (Waxmonsky et al., 2015), two additional sessions appeared appropriate. Bella and her mother noted that these sessions were helpful at maintaining progress and continuing to target irritability goals. This report was supported by the follow-up data that were consistent with data collected post treatment (see Table 1). During the week preceding follow-up assessment, she was reported to have slammed a door three times when frustrated by homework assignments related to math. No instances of “shut down” were reported.

Following study completion, the family was encouraged to seek out consultation from the team should any concerns arise regarding Bella’s behavior management. No such requests have been made (4 months post study at the time of manuscript preparation).

11 Treatment Implications of the Case

The current case demonstrates the feasibility of CBT for anger and aggression in children with DMDD. No existing studies have examined individually administered CBT for anger and aggression in youth with DMDD, though the need thereof is increasingly important as this new diagnosis gains clinical attention (Leibenluft, 2011; Roy et al., 2014). Our current case study shows how a child with DMDD can be effectively treated with a structured CBT

for anger and aggression treatment (Sukhodolsky & Scahill, 2012) enhanced with psychoeducation and behavioral activation strategies (Hopko, Lejuez, Ruggiero, & Eifert, 2003). The enhancements to the CBT program may have been especially important to Bella's excellent response to treatment. The five booster sessions allowed for a more gradual transition out of therapy and focused on decreasing non-episodic irritability, which may have been key to her long-term progress. These results are in contrast to previous findings that treatment gains were not maintained 3 months after group therapy for SMD (Waxmonsky et al., 2015).

Notably, Bella was a participant in our ongoing randomized controlled study that tests the utility of CBT for irritability in children across diagnostic categories. This study is based on the RDoC initiative (National Institutes of Mental Health, 2016) that aims to explore the core dimensions of psychopathology based on neurobiology and behavior, as opposed to the traditional categorical approach to diagnosis. Ultimately, RDoC attempts to integrate findings in genetics, neurology, molecular biology, cognitive science, and other disciplines to better inform our diagnostic classification system. The Negative Valence System, one of the five RDoC domains, encapsulates anger and aggression—the variables targeted in Bella's treatment. Applying a treatment for a core symptom area (anger and aggression) rather than a specific diagnosis may have been ideal in treating Bella. Given DMDD's high co-morbidity with other DSM diagnoses, including ADHD, and its significant overlap with ODD and depression, treatment of a specific categorical diagnosis would be challenging and likely misguided. In addition, almost all childhood psychiatric diagnoses are associated with increased risk of aggression (Jensen et al., 2007). If a treatment such as CBT for anger and aggression can be implemented successfully across diagnostic categories, it may decrease the need for diagnostic precision in an imperfect system such as the *DSM-5*. The current case study indicates that this singular treatment may be applied and/or modified to effectively treat a core symptom area in children that meets criteria for various *DSM-5* disorders. It will be especially useful to identify other treatment packages that may be applied trans-diagnostically, especially for commonly co-occurring disorders in youth.

A benefit of the current treatment may be the ease of implementation across professionals. Bella's provider possessed a PhD in clinical psychology, whereas other clinicians in our current study are psychology graduate students and child and adolescent psychiatry fellows. This flexibility in implementation may be particularly relevant for treatment of children with DMDD who may present with psychiatry referrals. Potential psychopharmacologic treatments for DMDD that have been suggested might include antidepressants, mood stabilizers, stimulants, and antipsychotics (Tourian et al., 2015); however, medication alone may not be ideal. Medications, of course, are not without side effects, many of them significant and/or requiring regular monitoring over the course of treatment, including with blood work. In addition, given that there are two distinct symptoms clusters being treated in DMDD—irritable or depressed mood and angry outbursts—it is reasonable to conclude that in many cases, more than one medication might be required to treat symptoms. Our CBT program with some modification appears to be effective in treating DMDD over a short period of time with minimal modifications and, as such, may be ideal for first-line treatment for youth DMDD, particularly those who present with irritable mood in between outbursts.

Bella's presentation did not reflect the symptom profile of some other youth DMDD. Namely, while she experienced significant and impairing irritability, she did not experience depressive symptoms such as withdrawal, anhedonia, or suicidal ideation. Therefore, the treatment implications of the current case are cautioned in terms of application to youth experiencing depressive mood between anger outbursts, wherein additional or different modifications would likely be warranted for treatment results and, above all, patient safety. It is of interest to note that behavioral but *not* mood symptom changes were an outcome of group therapy for SMD (Waxmonsky et al., 2015), which further speaks to the complex nature of treating the co-occurring symptoms captured by DMDD. Furthermore, the same must be stated in reference to anxiety symptoms, which commonly co-occur with DMDD but were not endorsed for Bella. Youth with DMDD and significant anxiety may benefit from additional anxiety-focused behavioral interventions (i.e., exposure and response prevention).

Another caution toward the current results is the fact that Bella was receiving medication for ADHD and mild anxiety. The medication was stable during the study, and it is unknown what effect the treatment would have had in a child with the same diagnostic profile without medication. Lastly, the fact that the current case study focuses on a female is not to be overlooked. Like all disruptive behavioral disorders, early evidence suggests that females may be less likely to be given a diagnosis of DMDD (Dougherty et al., 2014; Tufan et al., 2016). We are glad to provide evidence of treatment utility with a female patient, given that they may be less likely to be featured in this area of child psychology, though further study of treatment implications as they differ (or do not differ) across the sexes is warranted.

12 Recommendations to Clinicians and Students

Although we have previously stated that CBT for anger and aggression can be delivered by a range of clinicians, it is important that clinicians feel familiar and competent with delivering the complete manual prior to starting treatment. The modules reflect a variety of themes and strategies that may be useful to children; however, a high degree of flexibility is recommended (Kendall & Beidas, 2007). For example, it can be useful to improvise and incorporate material from later sessions if that material is pertinent to a child's presenting complaint on a given day. Furthermore, some children may dislike particular strategies (e.g., deep breathing), and it is significantly more important to maintain a strong therapeutic alliance by collaborating on goals and strategies than it is to achieve 100% fidelity for every session. In fact, as part of our current research study, an 80% fidelity rating is encouraged.

In addition, children with DMDD can be difficult to engage with due to both their baseline anger and irritability, as well as recurrent temper outbursts or meltdowns. It is likely that the clinician will experience at least one disruptive behavior episode (or many more) during session. These incidents are par for the course and, perhaps in a counterintuitive manner, are extremely beneficial to the child's progress in treatment. Specifically, therapists are able to demonstrate appropriate behavioral contingencies and extinction schedules that will be useful for parents to observe. Bella, for example, once came to session angry at her sister and refused to speak to her therapist. The therapist used the opportunity to remind Bella of the skills she could apply to "turn it around" and checked in with Bella's mother until Bella was

observed putting effort into that goal (i.e., taking deep breaths, attempting to join the conversation), at which time she was praised and given a choice of a fun activity. Thus, Bella's mother was able to observe selective attention, which can be a particularly difficult parenting skill for parents of children with disruptive behavior, and Bella was able to practice skills with the direct support of her clinician. We encourage clinicians and students not to dread disruptive behavior in session, but rather to welcome it as a unique and effective learning opportunity. However, clinicians must, of course, have a sound understanding of behavioral intervention to successfully respond to such incidents.

As with any type of behavioral modification, progress can be quite gradual. It may take several sessions before the child "buys in" to the treatment. It can be helpful to frame the treatment in terms of tangible benefits for the child; there is often a noticeable switch where the child recognizes that decreasing anger and aggression leads to specific and appreciable outcomes. For example, most children will recognize that hitting a peer will make that peer less likely to play with them in the future, even if they feel that the peer "deserves it," or that insulting a teacher will lead to them getting detention even if they feel it is "unfair." It is important to remember that these children often have a long history of feeling that they are "bad," and an integral component of treatment is to counter this belief. A strong rapport can be built in the first session, simply by validating the child's point of view and listening to recent difficulties without criticism. It is often helpful to alert the children that nothing shared in session will get them into trouble and, in fact, that the goal of therapy is to help them get in trouble less and enjoy their day-to-day life more. Ultimately, it is ideal for the child to recognize how their behavioral change will benefit them in their day-to-day life, which usually leads to them feeling proud about their efforts and accomplishments.

The parent check-ins at the end of each session are crucial to the success of the therapy. As outlined in the manual, be sure to stress to the parents during the first session how important it is to consistently praise positive behavior and to "catch the child being good." At each parent check-in, the parent should provide a concrete example to the clinician of the child engaging in a positive behavior or attempting to apply skills and tools learned during the previous CBT session. Due to the "review" nature of these check-ins, a notable risk is present that the parent and/or child will attempt to use the time to simply list complaints about the past week, which is counterproductive to long-term progress. As such, clinicians should troubleshoot specific concerns and integrate them into session material (e.g., problem solving) but should also assertively request "highlights" of the past week. In addition, it can be helpful to supplement the three parent sessions and parent check-ins with concepts and tools from Parent Management Training, including structured behavior plans for the home. The clinician should also remind parents that the goal of treatment is not 100% remission. Occasional outbursts are a normal part of development and are not always pathological. It is best to frame the child's success in terms of a decrease in the frequency and intensity of the target symptoms that were defined at the beginning of the treatment.

It is also important to point out to clinicians and students that the study of treatment for DMDD is new. Here, we present the results of an extant treatment that was adapted for a child with DMDD. It would be remiss for us to imply that this may be the only viable treatment for youth with DMDD, though it is difficult to expound upon treatment

alternatives. Nevertheless, as mentioned previously, DMDD overlaps with other diagnostic categories that have long-standing evidence for the utility of cognitive (e.g., Boxer & Butkus, 2005), behavioral (e.g., Folino, Ducharme, & Conn, 2008; Rote & Dunstan, 2011), and combined (e.g., Pass et al., 2016) approaches to treatment. We are not currently aware of an evidence-based psychotherapeutic approach that would be definitively distinct from the CBT treatment presented here.

Last, as shown in the current case, these youth are likely to present with a complex history and multiple diagnoses, including ADHD and internalizing disorders. Thus, it is important for clinicians and students working with these youth to be well versed in a variety of clinical presentations, as well as related behavioral and pharmacological treatments. Furthermore, in the age of RDoC, clinical training will likely benefit from integrating behavioral treatments for core symptoms—such as anger and aggression. Such a training priority may help to serve a larger population of youth, including those with more complex clinical presentations such as DMDD.

Acknowledgments

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This study is supported by National Institute of Mental Health (Grant/Award Number “R01 MH101514” to Drs. Denis Sukhodolsky and Kevin Pelphrey).

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Table 1

Pre-Treatment, Post-Treatment, and Follow-Up Assessments.

Measure	Pre-treatment (Week 0)	Post-treatment (Week 12)	Follow-up (Week 25)
Independent evaluation scores			
MOAS	32 ^a	2	4
CGI-Global Improvement	NA	1 "Very much improved"	1 "Very much improved"
Parent report measures			
CBCL-Aggressive Behavior	68 ^a	50	50
ARI	10 ^a	1	1
DBRS	13 ^a	2	3

Note. MOAS = Modified Overt Aggression Scale; CGI-I = Clinical Global Impression-Improvement score (as compared with baseline functioning); CBCL = Child Behavior Checklist (*t* scores); ARI = Affective Reactivity Index; DBRS = Disruptive Behavior Rating Scale.

^aClinical cutoff met or exceeded.