Psychological Treatment of Self-Injury Among Adolescents



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Self-injury is a dangerous and pervasive behavior problem among adolescents. Clinical trials testing the effectiveness of psychological treatments for this behavior problem among adolescents are lacking; however, several treatments have shown promise, such as those focused on teaching emotion regulation, distress tolerance, and interpersonal skills. The authors provide a case illustration of the use of dialectical behavior therapy, which is one of the most promising treatments for adolescent self-injury. They then discuss several important considerations in the treatment of self-injury, such as the use of strategies to increase treatment participation and the assessment of self-injury and related target behaviors over the course of treatment to determine its effectiveness and to manage risk of self-injury. © 2007 Wiley Periodicals, Inc. J Clin Psychol: In Session 63: 1081–1089, 2007.

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Non-suicidal self-injury (hereafter self-injury), which refers to the direct and deliberate destruction of one's own body tissue in the absence of intent to die, is a pervasive and dangerous problem among adolescents (Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007). The average age-of-onset of self-injury is 12 years old; therefore, we will focus primarily on self-injury among adolescents, although it has been reported in children as young as 6 years old (Nock & Prinstein, 2004). Self-injury often persists into adulthood;

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however, the long-term course of self-injury is not well known due to a lack of longitudinal data on this behavior. Despite its dangerousness and prevalence among adolescents, research on the etiology, assessment, and treatment of self-injury has increased only recently. In treating self-injury among adolescents, it is instructive to briefly review what is known about why they engage in the behavior.

Why Do Adolescents Engage in Self-Injury?

Natalie, a 19-year-old woman in her sophomore year of college, was referred for a mandatory psychological evaluation by the resident advisor of her college dormitory after Natalie's roommate walked in one afternoon to find her crying and cutting at her wrists with a pocket knife. Natalie told her resident advisor "It's really not a big deal at all . . . I don't want to kill myself and I know what I am doing so you don't need to worry about me." Nevertheless, she was referred for an evaluation by a psychologist. Natalie reluctantly went to a local outpatient clinic and upon first meeting the psychologist informed her: "Look, I have been to like a dozen shrinks already so save whatever it is you have to say. Cutting works better than any psychologist I have seen so I know you can't help me. I am only coming here because my school is making me. So what do I have to do to get out of here?"

So why was Natalie intentionally hurting herself? One way to understand this behavior is to consider the psychological correlates of self-injury. The majority of adolescents who engage in self-injury meet criteria for a current mental disorder, including internalizing (51.7%), externalizing (62.9%), and substance use (59.6%) disorders on Axis I and borderline (51.7%), avoidant (31.0%), and paranoid (20.7%) personality disorders on Axis II (Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006). Although the diagnoses of self-injurers may be helpful for case formulation and treatment in any given case, they offer little explanation of *why* adolescents engage in self-injury, as most of those with these diagnoses do not injure themselves.

It may be more useful to consider the function that self-injury serves for the individual. A growing body of research suggests that self-injury can serve four different functions located along two dichotomous dimensions: whether the reinforcement for such behaviors is positive versus negative, and whether the contingencies are automatic (i.e., intrapersonal) or social (i.e., interpersonal). Specifically, self-injury performed for automatic negative reinforcement serves the function of decreasing aversive internal states, whereas that done for automatic positive reinforcement functions to increase some favorable internal state. In contrast, self-injury performed for social negative reinforcement serves the function of decreasing some aversive external event, whereas that done for social positive reinforcement functions to increase the likelihood of some favorable social outcome (see Table 1). Research has supported the reliability and validity of this fourfunction model (Nock & Prinstein, 2004, 2005).

Of course, self-injury is a multidetermined behavior that cannot be fully explained by any single model. Evidence suggests that various other psychological (e.g., self-critical cognitive style), biological (e.g., serotonergic dysfunction), and environmental (e.g., media, social modeling) factors help explain the development and maintenance of self-injury.

Psychological Treatment of Self-Injury Among Adolescents

Randomized clinical trials testing the effectiveness of psychological treatments for selfinjury are rare. As a result, the armamentarium of evidence-based treatments is quite limited compared to those for other behavioral problems, such as depressive and anxiety

Table 1
Four-Function Model of Self-Injury

	Positive reinforcement	Negative reinforcement
Automatic (intrapersonal)	"To feel something To get a rush" Correlates include symptoms of	"To get rid of bad feelings To distract myself from bad thoughts"
	posttraumatic stress disorder and major depression	Correlates include hopelessness and a history of suicide attempts
Social (interpersonal)	"To get attention to let others know how bad I am feeling"	"To get others to leave me alone to get out of having to do something"
	Correlates include social concerns (e.g., perfectionism) and symptoms of major depression	Correlates include social concerns (e.g., perfectionism) and symptoms of major depression

Note. Each cell contains examples of reasons adolescents commonly endorse for each function, as well as several correlates of each function (see Nock & Prinstein, 2004, 2005, for details).

disorders. Nonetheless, clinicians treating adolescents who engage in self-injury can be informed by two important literatures.

First, decades of clinical research have supported the use of behavior therapy for the treatment of self-injury among individuals with developmental disabilities. A recent review of 35 years of research on this topic that included 396 articles and 706 participants (most studies used single-case experimental designs) revealed that behavior therapy approaches yielded an 80% reduction in self-injury over the course of the interventions (see Kahng, Iwata, & Lewin, 2002). This work involves conducting a careful behavioral assessment aimed at identifying the function of the self-injury in each case, followed by the application of reinforcement-based interventions. Although the participants in these studies had a developmental disability, the functions of self-injury revealed in these studies matches closely with those reported in studies of nondevelopmentally disabled adolescents.

Second, dialectical behavior therapy (DBT; Linehan, 1993a, 1993b), has emerged as an effective treatment developed specifically for the treatment of suicidal and non-suicidal self-injury. It was initially examined and shown to be effective in treating adult women with borderline personality disorder (BPD; Linehan, Armstrong, Suarez, Allmon, & Heard, 1991), and its effectiveness has since been replicated in five different randomized clinical trials to date (see Linehan et al., 2006; Muehlenkamp, 2006). These trials have consistently demonstrated that DBT reduces the occurrence of self-injurious behaviors in general. However, it is notable that when self-injury has been examined as a distinct outcome, the decreases in this behavior for those in the DBT condition generally have not been significantly different from those in the comparison condition (e.g., Linehan et al., 2006).

Dialectical behavior therapy recently has been adapted for use with adolescents (Miller, Rathus, Linehan, Wetzler, & Leigh, 1997) and has been shown to decrease the occurrence of suicidal and non-suicidal self-injury in both outpatient and inpatient settings (Katz, Cox, Gunasekara, & Miller, 2004; Rathus & Miller, 2002). Those in the DBT conditions showed similar reductions in self-injury to those in the control conditions. Overall, DBT has consistently shown significant reductions in self-injury for both adults and adolescents; however, these reductions generally have not been significantly better than those observed in credible alternative conditions, such as treatment by experts in the community. Thus, there is a strong need for evidence from randomized clinical trials demonstrating the effectiveness of a treatment that is superior to other treatments at decreasing

self-injury. Regardless of such evidence, clinicians should use careful and continuous assessment of self-injury (see Nock, Wedig, Janis, & Deliberto, in press) and other target behaviors over the course of treatment to manage risk of self-injury and to determine the effectiveness of their intervention and modify their treatment as necessary (see Nock, Goldman, Wang, & Albano, 2003).

Dialectical Behavior Therapy With Adolescents

Dialectical behavior therapy is a complex treatment that includes elements of behavior therapy, cognitive therapy, client-centered therapy, and other approaches. Below we highlight just a few key points to convey some of its fundamental elements. The interested reader should see Linehan (1993a) for comprehensive account of DBT for adults and Miller, Rathus, and Linehan (2007) for a DBT modified with adolescents.

As a behavioral therapist, the DBT clinician carefully identifies and operationalizes the target behaviors to be changed in treatment (using a comprehensive assessment of mental disorders, problem behaviors, and client functioning) and continuously measures these over the course of treatment (using a daily diary card). The DBT clinician helps the client to identify the antecedents and consequences of their self-injury and other target behaviors so that they will better understand their behaviors and will be able to modify them. Once the clinician and client understand the functions of the client's self-injury, they work together to develop other alternative and incompatible behaviors to replace it. As with other forms of behavior therapy, the clinician attempts to modify the client's environment to achieve behavior change, and with adolescents this involves working with the family throughout the course of treatment. In addition to sharing the treatment philosophy and plan with the family, the clinician works to modify their interactions with the adolescent when necessary, such as by teaching parent management skills.

Although many aspects of DBT come directly from behavior therapy and focus on behavior change, DBT also includes an emphasis on acceptance. The balance between change and acceptance is a core feature of DBT. Indeed, the term *dialectic* refers to a philosophical approach in which truth is obtained by combining contradictory points (thesis and antithesis) into a new whole (synthesis). Attending to both behavior change and to acceptance is especially valuable in the case of self-injury. Self-injury is most often motivated by an inability to tolerate aversive thoughts or feelings and so learning to accept and tolerate one's current experience or circumstances rather than trying to change them, can be quite useful. This DBT emphasis shares qualities with acceptance and exposure-based approaches used in other treatments in which the clinician helps the client to expose himself or herself to feared or avoided stimuli or events and to tolerate them, thus precluding the need for maladaptive escape or avoidance behaviors (such as self-injury, suicide attempts, substance use, agoraphobia).

Clients participating in DBT attend weekly individual therapy sessions in which the clinician first works with the client on making a commitment to the treatment and then focuses on each week on the main targets of DBT, which include (a) decreasing life-threatening behaviors, (b) decreasing therapy-interfering behaviors, (c) decreasing quality-of-life interfering behaviors, and (d) increasing behavioral skills. The client (and family in the case of adolescent DBT) also attends weekly, group-based skills training in which the client learns the main skills taught in DBT, which include (1) mindfulness, (2) emotional regulation, (3) interpersonal effectiveness, (4) distress tolerance, and (5) "walking the middle path" skills. This last skill module is unique to adolescent DBT and involves teaching several family-focused skills including validation of self and others, the use of behavioral principles with self and others, and three common adolescent-family dilemmas (see Miller et al., 2007).

The outpatient version of adolescent DBT, developed by Miller and colleagues (2007), is delivered over the course of 16 weeks, which is significantly shorter than the 1-year period recommended for adult DBT. An even shorter version of adolescent DBT is currently being evaluated in a treatment program directed by one of the current authors (M.H.), in which adolescents participate in intensive DBT groups 4 hours per day, 5 days per week for 4 weeks. This more intensive version was developed as a treatment option for adolescents at particularly high risk of suicide and other dangerous behaviors, and in response to the particularly high-risk period for suicide that occurs immediately postdischarge from inpatient settings.

In all forms of DBT, clients have access to their clinician for phone consultation during which they can receive skills coaching outside of sessions. This is invaluable for managing crises that may arise and also provides a wonderful opportunity to help adolescents learn to use skills when they really need them out in the world. Finally, clinicians providing DBT participate in a weekly consultation team meeting in which they receive feedback, direction, and support from fellow DBT clinicians.

Case Illustration

Presenting Problem and Client Description

Kira, a 17-year-old, African American girl who recently stopped attending high school, was referred for outpatient treatment by her father soon after he learned that she had begun engaging in self-injury. Her father was informed of this by Kira's 24-year-old sister who walked into her bedroom one evening to find her cutting herself with a razor blade. Kira lived at home with her father, an attorney, and her two older sisters. Kira's mother died in a car accident when Kira was 7 years old, after which she became depressed. She then saw a psychiatrist for a brief course of psychotherapy and antidepressant medication, both of which she discontinued after approximately 6 months. Separate interviews with Kira and her father revealed no other family history of psychological disorder.

At the time of the initial assessment, the clinician administered a semistructured diagnostic interview to obtain an Axis I and II diagnosis. The combination of Kira's responses and those of her father resulted in Kira receiving a diagnosis of major depressive disorder and BPD. Kira reported that she had been engaging in self-injury approximately 2 to 3 times per week for the past 6 months, with thoughts of self-injury occurring approximately once per day. She used several different methods of self-injury, most often cutting her wrists, ankles, and sometimes stomach with a razor, and less frequently using a safety pin or lighter to injure these areas. Given self-injury is associated with the presence of other forms of self-injurious thoughts and behaviors (e.g., suicide ideation, plans, and attempts), the clinician conducted a comprehensive assessment of these constructs. Kira reported experiencing thoughts of suicide approximately once per week and denied any history of suicide attempts. She reported smoking marijuana once per week and drinking alcohol once per month, both only done when with friends.

Kira presented to the clinic dressed completely in black and was somewhat somber in demeanor (she described herself as being "Goth"). She stated bluntly during the initial interview that she did not want to be in treatment and was only coming because her father gave her the option of being admitted to an inpatient unit or coming to outpatient treatment, so she chose the latter. When asked about her home life she stated, "I hate my father." She described her school life as one in which she used to do very well academically and was quite involved in extracurricular activities, but her grades and participation in activities both declined significantly this year, which was her first in high school.

Kira reported a long history of experiencing intense emotional reactivity in response to stressful events dating back to childhood. Her father reported that Kira was often oppositional and defiant of adults and "threw tantrums when she did not get her way"; however, since her mother died Kira acted out less frequently, but more intensely. By her report, Kira would occasionally experience extreme anger at others or herself, but was often not able to express her thoughts and feelings in an adaptive way and did not like the idea of simply tolerating them without acting to change them.

Kira reported that she first learned about self-injury from a friend during middle school a few years earlier, but did not think much of it at the time. Approximately 8 months before beginning treatment (2 months before first engaging in self-injury), Kira had a falling out with her boyfriend and friends and started hanging out with a different group of friends, several of whom she reported occasionally engaged in self-injury. Kira reported first engaging in self-injury herself after she got in a fight with her ex-boyfriend. She was home alone in her room and scratched her wrist with a safety pin until she drew blood. She reported that doing this decreased her feelings of anger and self-hatred. She also reported that after she scratched her wrist she called her ex-boyfriend on the telephone to let him know what she had done, and she also told her new group of friends about the incident.

Case Formulation

We conceptualized Kira's self-injury as being learned from peers and used as a means of (a) decreasing or distracting from her intense, aversive thoughts and feelings (i.e., automatic negative reinforcement); and (b) communicating her distress and unhappiness to others, especially her boyfriend and friends (i.e., social positive reinforcement). Given this conceptualization, treatment was focused on teaching Kira more adaptive skills for changing her negative thoughts and feelings when possible, and tolerating them when they cannot be changed so that she would not need to use self-injury (or alcohol or substances) for these purposes. Treatment also focused on teaching Kira more effective interpersonal skills so that she could communicate her thoughts and feelings to others without resorting to self-injury. We believed DBT was ideally suited to treat Kira's selfinjury and other problems given the relevance of the core treatment modules. The dialectic focus of DBT on both change and acceptance provided a useful perspective with which to validate Kira's desire to use self-injury as a coping strategy on one hand, and the desire to develop more effective strategies for dealing with her problems, on the other. We also thought it would be beneficial in both the short- and long-term to involved Kira's father in treatment so that he could also learn the skills we were teaching Kira, and learn some parenting techniques that would be useful in helping to manage Kira's behavior at home. Thus, we could work with him to change contingencies in the home that might be reinforcing some of Kira's problem behaviors.

Course of Treatment

Sessions 1–2: Commitment. Like many children and adolescents presenting to treatment, Kira was not excited to be there and, as mentioned above, was only attending treatment on her father's insistence. Treating adolescent self-injury is challenging even if the adolescent is motivated to stop this behavior, but it is infinitely more difficult if the client has no desire to stop. Thus, rather than beginning with behavior change we spent the first two sessions developing Kira's motivation to participate in treatment as well as her father's motivation to bring Kira for treatment and be involved as needed. We did so

using the Participation Enhancement Intervention (Nock & Kazdin, 2005), a brief, manualized intervention that involves asking the client to describe the factors motivating them to attend and adhere to treatment. We then present them with potential barriers to participating in treatment (e.g., transportation problems, beliefs that treatment is too demanding or irrelevant, poor relationship with the clinician) and help them to generate solutions for overcoming any barriers present. During the first two sessions, rather than telling Kira that she needed to change her behaviors and presenting arguments for why she should do so, the clinician had Kira herself make such arguments repeatedly and in doing so increased her motivation to participate in treatment and decrease her self-injury. It is important in treating children and adolescents that unmotivated or ambivalent parents receive such an intervention given it is the parent who makes decisions about beginning and remaining in treatment, and the parent often plays a key role in helping to change and maintain the adolescent's behavior.

Sessions 3–12: Decreasing self-injury and therapy-interfering behaviors. The primary target of treatment was Kira's self-injury. Kira recorded the daily frequency of self-injury, alcohol use, and substance use (as well as the frequency and intensity of her thoughts of each) using a diary card (Miller et al., 2007) that she brought to treatment each week for review with her clinician. In her weekly individual sessions, Kira reviewed each episode of self-injury from the past week and worked with the clinician to identify the antecedents and consequences of the behavior to understand its occurrence. They also generated and practiced alternative behaviors for Kira to use as a means of emotion regulation and communication with others. For instance, consistent with recent work suggesting that aerobic exercise can be effective for decreasing self-injury (Wallenstein & Nock, 2007), Kira began engaging in exercise several times per week to help increase her mood and decrease her self-injury. In addition to her individual sessions, Kira participated in weekly DBT group skills training sessions with six other adolescents being treated using DBT at the same clinic. These sessions focused on teaching the core DBT modules (see Miller et al., 2007), which the clinician reviewed and practiced with Kira and encouraged her to use as needed throughout the week.

Kira's father brought her regularly for both individual and group sessions, which were scheduled on the same day of the week and at consecutive time slots to decrease burden. However, Kira displayed some therapy-interfering behaviors over the early course of treatment, such as displaying noncollaborative behavior during sessions (e.g., remaining silent for larger portions of the session and stating "I don't care" in response to many of the clinician's questions) and failing to complete and bring in a diary card on several occasions. These behaviors were addressed immediately by the clinician. He first described each behavior to Kira and asked her for an explanation for why these behaviors occurred. The clinician then more carefully examined the determinants of the behaviors by assessing the antecedents and consequences of each. The clinician also reintroduced the Participation Enhancement Intervention on several occasions to increase Kira's motivation and engagement in treatment whenever necessary. This appeared to be an effective strategy, as Kira attended both individual and group sessions consistently. She also became increasingly engaged in treatment, completing her diary card more regularly, asking more questions about the treatment, and becoming more forthright about the occurrence and apparent determinants of her self-injury and other target behaviors.

Sessions 13–24: Decreasing quality of life-interfering behaviors. After Kira's self-injury and therapy-interfering behaviors decreased, the treatment focus turned to address other behaviors that interfered with Kira's quality of life, such as her alcohol and substance

use as well as her difficult relationship with her father and friends. The same treatment approach was also applied to her alcohol and substance use.

Kira's relationships with her father and friends were much more difficult to operationalize, understand, and modify. As one example, Kira and her father both expressed concerns about their relationship, but it took several weeks and multiple joint sessions where their interactions could be observed to understand the ways in which their behaviors toward each other were problematic. Primary areas of conflict were related to disagreements about Kira's independence (e.g., curfew, privileges, privacy) and about the content and tone of Kira's communications with her father. Each problem was addressed by working with Kira and her father to use the skills learned in treatment to identify, assess, and change problem behaviors and to tolerate those that they cannot change. For instance, Kira used skills learned in the interpersonal effectiveness module of DBT to improve the way she spoke to her father and communicated her thoughts, feelings, and concerns to him. Through discussions with the clinician, Kira's father agreed to grant Kira greater independence contingent on her meeting behavioral goals (e.g., coming home on time for a certain number of days in a row).

Outcome and prognosis

Kira's self-injury decreased to zero by her sixth week of treatment, and she reported engaging in self-injury on only two occasions over the remaining sessions. She continued to have occasional thoughts of self-injury (i.e., approximately once per week), but these were significantly decreased in frequency and intensity from the beginning of treatment. Kira's substance use also stopped after approximately 20 sessions, and her alcohol use decreased, but she continued to drink on occasion, such as at high school parties. Kira and her father both reported significant improvements in their relationship. Kira also reported some improvements in her relationships with peers, but continued to experience some difficulties, although these were not outside what would be considered normal for most adolescents.

Treatment was terminated at the conclusion of the initially agreed upon 6-month treatment period, and Kira and her father both reported great satisfaction with their participation in DBT. The clinician discussed with Kira and her father the importance of continuing to use all that they learned in treatment, and to keep their treatment materials (treatment binders containing hand-outs, etc.) on hand for reference. They were encouraged to come back in for "booster sessions" should problems resurface in the future.

Clinical Issues and Summary

Adolescent self-injury is a prevalent and dangerous behavior that typically benefits from psychological treatment. Perhaps the most critical issues facing clinicians working with self-injurious adolescents are that (a) these behaviors are difficult to predict, and (b) research evidence on the effectiveness of specific treatments for adolescent self-injury is lacking. These factors, together, make treating adolescent self-injury difficult and often quite scary for the clinician. In the absence of strong research evidence, clinicians are encouraged to use what is known about why individuals engage in self-injury and about how best to assess self-injury in developing a case conceptualization for each case (see Nock et al., in press; Walsh, this issue, pp. 1057–1068). Moreover, clinicians can employ available treatments that have a successful track record in the treatment of adults, such as DBT, and incorporate continuous assessment of target behaviors to monitor change over the course of treatment.

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