Evidence-Based Psychosocial Treatments for Self-Injurious Thoughts and Behaviors in Youth

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Abstract

Objective—To review the current evidence base of psychosocial treatments for suicidal and nonsuicidal self-injurious thoughts and behaviors (SITBs) in youth.

Method—We reviewed major scientific databases (HealthSTAR, MEDLine, PsycInfo, PubMed) for relevant studies published prior to June 2013.

Results—The search identified 29 studies examining interventions for suicidal or nonsuicidal SITBs in children or adolescents. No interventions currently meet the *JCCAP* standards for Level 1: *well-established* treatments. Six treatment categories were classified as Level 2: *probably efficacious* or Level 3: *possibly efficacious* for reducing SITBs in youth. These treatments came from a variety of theoretical orientations, including cognitive-behavioral, family, interpersonal, and psychodynamic theories. Common elements across efficacious treatments included family skills training (e.g., family communication and problem-solving), parent education and training (e.g., monitoring and contingency management), and individual skills training (e.g., emotion regulation and problem-solving).

Conclusions—Several treatments have shown potential promise for reducing SITBs in children and adolescents. However, the probably/possibly efficacious treatments identified each have evidence from only a single randomized controlled trial. Future research should focus on: replicating studies of promising treatments; identifying active treatment ingredients; examining mediators and moderators of treatment effects; and developing brief interventions for high-risk periods (e.g., following hospital discharge).

Keywords

suicide; suicide attempt; nonsuicidal self-injury; deliberate self-harm; evidence-based; intervention; treatment

Introduction

Self-injurious thoughts and behaviors (SITBs) are a broad class of cognitions and actions aimed at intentional and direct injury to one's own body. Although the range of terms

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employed to describe SITBs (e.g., suicidality, parasuicide, deliberate self-harm, self-mutilation) traditionally has created confusion, the field has recently begun to focus on the distinction between *suicidal* and *nonsuicidal* self-injurious thoughts and behaviors based on key differences in the prevalence, frequency, function, and severity of these behaviors (Nock, 2009; 2010). Most notably, suicidal phenomena (e.g., suicide ideation, plans, attempts) are associated with any intent to die whereas nonsuicidal phenomena (e.g., nonsuicidal self-injury [NSSI], suicide threats and gestures) are not (Nock, 2010). Though suicidal and nonsuicidal SITBs are distinct, growing research indicates that NSSI is a significant risk factor for suicidal behavior (Asarnow et al., 2011b; Wilkinson et al., 2011), suggesting a complex association between these two types of behaviors.

Rates of SITBs are relatively rare in childhood, but increase drastically during the transition to adolescence (Nock et al., 2008; 2013). In the United States, suicide is the third leading cause of death in youth, with approximately 4,600 suicide deaths among adolescents each year (Centers for Disease Control and Prevention [CDC], 2010). Moreover, current estimates indicate that each year approximately 16% of adolescents will seriously consider killing themselves, 13% will make a suicide plan, and 8% will attempt suicide (CDC, 2012). NSSI is even more common among adolescents with studies reporting an average lifetime prevalence of 18% in this population (Muehlenkamp et al., 2012).[1]

Given that suicidal and nonsuicidal self-injurious thoughts and behaviors (which will be referred to collectively as *SITBs* for the remainder of the manuscript) usually begin between the ages of 12 and 14 (Nock, 2009) and millions of adolescents engage in SITBs each year, treatments designed specifically for youth are especially important. Unfortunately, although most suicidal adolescents have received some form of mental health treatment (Nock et al., 2013), and the rate of treatment for suicidal behavior in the U.S. has increased (Kessler, Berglund, Borges, Nock, & Wang, 2005), the rate of suicidal behavior has not shown a similar decrease (Kessler et al., 2005). Taken together, this research indicates that the field is in urgent need of more efficacious treatments for SITBs.

Importantly, over the past 10 years, there has been a sharp increase in research examining interventions specifically designed for SITBs in youth. The purpose of the current manuscript is to review and evaluate the evidence-base of psychosocial treatments for SITBs in children and adolescents. This is the first review of evidence-based treatments for SITBs in youth that has been included in the *Journal of Clinical Child and Adolescent Psychology (JCCAP)*, which reflects the growing research in this area, as well as the need for a critical examination of existing treatments' efficacy to inform both future treatment research and clinical care.

Review Parameters

To identify all relevant studies that examined a psychosocial intervention aimed at reducing SITBs in children or adolescents, we performed a comprehensive search of four major scientific databases (HealthSTAR, MEDLine, PsycInfo, PubMed) for articles published

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[1]NSSI rates include a broad range of behaviors from severe behaviors, such as skin-cutting, to behaviors that cause less tissue damage, such as scratching and pinching.

prior to September 2013. Searches used a number of different terms for SITBs (e.g., self-injury, nonsuicidal self-injury, deliberate self-harm, self-harm, suicide ideation, suicide attempt, suicidal behavior) and interventions (e.g., intervention, therapy, treatment). In addition, to ensure that we included the most current treatment research, we also searched ProQuest.com for dissertation abstracts relevant to our review (although this search did not generate any relevant unpublished dissertations), as well as ClinicalTrials.gov for any clinical trials currently in progress or recently completed that examined relevant treatments for SITBs in youth. Our initial aim was to include only randomized controlled trials (RCTs) of interventions for SITBs (see review: Brent et al., 2013). However, due to the paucity of research in this area, and in line with our goal to review *all* evidence-based interventions in this area, we broadened our review to also include non-randomized controlled studies (i.e., studies including a comparison group but without randomization) and pilot studies describing promising new interventions for reducing SITBs in youth.

Inclusion and exclusion criteria

Studies were included if they examined an intervention: (1) for children and/or adolescents under the age of 19, (2) specifically designed to treat SITBs, and (3) measured a specific SITB outcome. First, we restricted our review to studies that examined interventions exclusively in youth. A number of studies were excluded because they examined interventions across adolescence and adulthood, but did not examine treatment effects separately in adolescent participants (e.g., Bateman & Fonagy, 1999; Hawton et al., 1981; 1987). We included two studies that examined adolescents and young adults, ages 15-24 (Robinson et al., 2012; Rudd et al., 1996), because young adults are relatively close in age to older adolescents. All other studies reviewed here included participants 19 years of age or younger. Of note, given that SITBs are relatively rare in childhood, most studies focused on treating SITBs in adolescents. A few studies included children as young as age 10 (e.g., Asarnow et al., 2011a; Harrington et al., 1998; Huey et al., 2004) and one study focused on children ages 8 to 11 (Perepletchikova et al., 2011). Due to the limited research on treatments for SITBs in children, we did not devote a separate section to these studies but, instead, highlighted in the text those interventions that have been examined in pre-adolescent youth.

Second, given that a major goal of this review is to inform clinical care that targets SITBs, we only included studies that examined treatments specifically designed for SITBs. A comprehensive review of all treatments for all disorders that might include a SITB outcome was outside the scope of this review, and we did not want to give interventions for specific disorders (e.g., borderline personality disorder and major depression) preferential coverage. We considered including school-based prevention programs that focused on SITBs, but ultimately decided to exclude these studies from our review: prevention programs generally aim to screen and identify high-risk youth, whereas our review was focused on interventions for youth that are already determined to be at high-risk (for reviews of prevention programs: see Katz et al., 2013; Robinson et al., 2013).

Third, we only included studies that reported one of the following specific SITB outcomes: (a) nonsuicidal self-injury (NSSI: self-injurious behavior performed without intent to die),

(b) suicide ideation (SI: thoughts of ending one's life), (c) suicide planning or preparations (SP: actions taken to plan or prepare to attempt suicide), (d) suicide attempts (SAs: self-injurious behavior performed with at least some intent to die), (e) suicide threats or gestures (ST: threatening to harm oneself without intent to die) (f) deliberate self-harm, self-harm, or parasuicide (DSH: terms used to refer collectively to self-injurious behaviors performed with OR without intent to die), and (g) suicide events or suicide-related behavior (SE or SRB: terms used to refer collectively to suicidal thoughts, plans or preparatory acts, and attempts). We excluded the following types of studies if they did not include a specific SITB outcome: treatment adherence studies (e.g., Spirito et al., 2002a) and studies including measures of broad suicide risk factors, such as psychiatric symptoms (e.g., Orbach & Bar-Joseph, 1993). It is important to note that most studies included in our review were designed to test interventions for youth with a past history of SITBs who were at risk for future SITBs. Therefore, treatment efficacy was determined by assessing the recurrence of SITBs over the treatment period (e.g., suicide *reattempts*).

Evaluation criteria

Psychosocial interventions for SITBs in youth were assessed using the *JCCAP* evidence-based treatment evaluation criteria (see Table 1). The *JCCAP* five-level system (Southam-Gerow & Prinstein, in press) is adapted from the evaluation criteria initially proposed by Chambless et al. (1993) and the APA Division 12 Task Force on the Promotion and Dissemination of Psychological Procedures to determine intervention potency, which were later revised and expanded to cover a wider range of treatment studies (e.g., pilot studies) (see Chambless et al., 1998; Chambless & Hollon, 1998; Silverman & Hinshaw, 2008). Using the *JCCAP* criteria, treatment efficacy is determined by evaluating the number and quality of studies comparing the experimental intervention to another active treatment/ psychological placebo/medication or to a wait list/no treatment control. Randomized controlled trials (RCTs) are the highest-quality study used to evaluate a treatment's efficacy. Based on the level of evidence, interventions are placed into one of five categories (see Table 1): *well-established* (Level 1), *probably efficacious* (Level 2), *possibly efficacious* (Level 3), *experimental* (Level 4), and *treatments of questionable efficacy* (Level 5). For interventions with mixed findings, we used the guidelines provided by Chambless and Hollon (1998) to evaluate "whether the preponderance of studies argue for the treatment's efficacy" (p.13). First, we examined the quality of the disparate studies and weighted rigorous studies, such as RCTs, more than other types of study designs. Second, if conflicting results were found using comparable treatment designs, we evaluated interventions conservatively and did not classify them as *well-established* or *probably efficacious* treatments.

It is important to note that, for *JCCAP* Evidence-Base Updates, interventions are classified into broad families of treatments based on the target and mode of treatment (e.g., Family-based therapy: Ecological) rather than by "brand names" of treatments (e.g., Multisystemic Therapy; Huey et al., 2004) (for a rationale for this change: see Southam-Gerow & Prinstein, in press). In the sections below, we review the existing interventions for SITBs in youth using the "brand names" and then, to be consistent with the other *JCCAP* Evidence-Base Updates, we evaluate the overall families of treatments (rather than each "brand name"

treatment individually) using the *JCCAP* evaluation criteria displayed in Table 1. However, we recognize that these broad intervention categories may not be mutually exclusive and that collapsing across interventions in this manner does not allow for consideration of differences between treatments that may be important.

Review of Interventions for Self-Injurious Thoughts and Behaviors

Based on the review parameters described above, our search yielded 29 relevant intervention studies: 18 RCTs; five non-randomized controlled trials; and six pilot studies. Table 2 displays the descriptive information and main findings for each study, and Table 3 summarizes the level of evidence for each broad treatment family. Three things are important to note about the information presented in these tables. First, many interventions designed for children and adolescents included a family component, even those that were primarily designed as individual treatments. Based on the primary modality and target of treatment, we categorized interventions as follows: (1) Treatments where the family was the primary focus of the intervention (e.g., Attachment-Based Family Therapy: Diamond et al., 2010) were classified as family-based therapy; (2) Interventions that focused on individual skills training and augmented treatment with family therapy sessions (e.g., Integrated Cognitive-Behavioral Therapy; Esposito-Smythers, Spirito, Kahler, Hunt, & Monti, 2011) were classified as individual therapy + family therapy; and (3) Treatments where the adolescent was the main focus of the intervention and family sessions were optional or not presented as integral to the treatment plan (e.g., Skills-Based Treatment; Donaldson, Spirito, & Esposito-Smythers, 2005) were classified as individual therapy. This classification is consistent with other EBT Updates in this series (e.g., Freeman et al., 2014).

Second, when comparing interventions, it is important to consider the type of SITBs examined. For instance, some interventions examined treatment effects on suicidal thoughts only, whereas others examined the impact on specific suicidal behaviors, such as suicide attempts. Table 2 displays the specific SITB outcomes and measures included in each study (if specified), and Table 3 indicates which SITB outcomes were examined in studies of each treatment family.

Third, the majority of treatment conditions, even control or comparison conditions, showed a marked reduction in SITBs over time (an issue we will return to at the conclusion of our review). For trials that included a comparison condition, we focused our discussion on between-group differences (i.e., those attributable to the experimental treatment examined). Significant treatment mediators or moderators (when reported) are displayed in the last column of Table 2.

And finally, attrition is a major problem in treatment research with youth (Kazdin, 1996), and the studies in our review were no exception. This issue is further complicated by the different evaluation methods of treatment attrition and compliance used across studies; for instance, some studies report detailed information about the number of sessions completed by each treatment group, other studies report the number of individuals assessed at follow-up only, and still others report little to no information about dropout rates. Chambless and Hollon (1998) note that dropout becomes a serious concern when rates of attrition differ

between the experimental treatment and comparison treatment groups. They suggest that, especially in these cases, intent-to-treat (ITT) analyses are crucial to examine treatment outcomes for all individuals randomized to a specific intervention. However, this does not address the issue that, with high dropout rates, a small percentage of individuals are actually receiving a particular intervention. For the current review, we did not want to penalize studies that *did* provide adequate information about treatment dropout or more intensive treatments that may have had greater dropout than briefer interventions. Therefore, we included a column in Table 2 detailing information about treatment attrition and compliance in each study (when available) and we discuss treatment dropout and use of ITT analyses in the text – particularly when evaluating the more promising interventions.

Cognitive-behavioral therapy (CBT)

Six studies in our review examined a form of CBT for reducing SITBs in youth. From a CBT perspective, maladaptive behaviors, such as SITBs, result from distorted thinking patterns and deficits in specific skills (e.g., emotion regulation and problem-solving). CBT aims to reduce SITBs by challenging and modifying cognitive distortions, and by strengthening skills to adaptively cope, communicate, and solve problems.

CBT-Individual—Two studies were classified as individual CBT because they examined interventions primarily focused on addressing the adolescent's skills deficits. Of note, both interventions included some form of optional family training or therapy, but these components were viewed as adjuncts to the adolescent's individual therapy; moreover, the studies reported that these optional family trainings were infrequently used.

In a small RCT with adolescent suicide attempters (*n* = 39), Donaldson, Spirito, and Esposito-Smythers (2005) compared a six-month individual skills-based treatment (SBT) (e.g., emotion regulation and problem-solving skills) to supportive relationship therapy (SRT). Although both were primarily individual interventions, parents attended the initial treatment session and were offered one optional family problem-solving session if needed. Adolescents in both conditions reported reductions in SI over the treatment period and follow-up, but there were no differences between conditions. In addition, there were no between-group differences in SAs over the treatment follow-up. Results from this trial indicate that individual CBT is not superior to supportive therapy for reducing SAs and SI in youth with a history of suicide attempts.

Taylor and colleagues (2011) also examined a time-limited (8-12 sessions over 6 months) individual CBT package – Manualized Cognitive-Behavioral Therapy (MCBT) – for adolescent DSH, which incorporated common CBT treatment components, such as problem-solving and coping skills training, as well as recognizing connections between thoughts, feelings, and behaviors. In addition, an optional brief (3-session) psychoeducation group was offered for parents but only two parents participated. Results from the initial pilot study in 25 adolescent outpatients indicated reductions in DSH from pre- to post-treatment that were maintained at 3-month follow-up. However, it is important to note that attrition over the treatment period was high (36% of adolescents dropped out) and DSH reductions were within-participants (because there was no control condition). RCTs in larger samples are

needed before any firm conclusions can be drawn about the efficacy of MCBT for DSH in youth.

Individual CBT has not been shown to be more efficacious than another treatment for reducing SITBs in adolescents. Using the *JCCAP* evaluation criteria, individual CBT was classified as *Level 4: experimental* for DSH and SI in youth.

CBT-Individual + CBT-Family—Two studies were classified as combined individual CBT and family CBT because the interventions included both individual and family sessions as integral components of the treatment packages. Moreover, reductions in risk factors at both the individual and family level were identified as treatment targets. In an initial pilot study, Esposito-Smythers and colleagues (2006) modified their individual CBT treatment package (examined by Donaldson et al., 2005) to include family therapy and motivational enhancement. The combined individual and family CBT intervention was examined in a small sample of adolescents ($n = 6$) with recent SI or SAs and comorbid substance use disorders. Adolescents reported reductions in SI from pre- to post-treatment but the intervention had little impact on SAs (33% of the sample attempted suicide during the treatment period). Because this trial lacked a comparison group, conclusions about the efficacy of individual CBT + family CBT for reducing SI in youth are tentative.

A CBT-individual and family intervention was also examined in the large ($n = 124$) Treatment of Adolescent Suicide Attempters (TASA) study – an open trial designed to examine intensive and tailored treatments for adolescent suicide attempters with major depression (Brent et al., 2009). The TASA trial compared Cognitive Behavior Therapy for Suicide Prevention (CBT-SP: see Stanley et al., 2009), a medication algorithm, and the combination of CBT-SP and medication. CBT-SP consists of both individual CBT (e.g., behavioral activation, problem-solving) and family skills training (e.g., family problem-solving, family communication) over 6 months. Treatments were evaluated based on reductions in suicide events (SEs) – a category that included completed suicide, attempted suicide, preparatory acts towards imminent suicidal behavior, and suicidal ideation. There were no differences between the treatment groups in SEs at six-month follow-up, but the authors noted that SE rates generally, and SA rates specifically, were lower in the TASA trial compared to those reported in naturalistic studies of high-risk adolescent samples following hospital discharge (e.g., Goldston et al., 1999). Comparing outcomes across treatment conditions is complicated for a few key reasons. First, more high-risk adolescents received the combined intervention than medication or therapy alone. RCTs demonstrating superiority of CBT-SP compared to another active treatment are needed. Second, individual and family treatment strategies were tailored to each adolescent and therefore active treatment components varied across participants. Finally, and most importantly, the TASA trial was not intended to compare any single intervention to treatment-as-usual (TAU); the lack of group differences between the three treatment arms may be due in part to significant treatment effects for all conditions.

It is difficult to evaluate the efficacy of combined individual and family CBT interventions based on these two trials. However, given the existing evidence, combined CBT-Individual + CBT-Family was classified as *Level 4*: *experimental* for reducing SE and SI in youth.

CBT-Individual + CBT-Family + Parent Training—Building on earlier versions of their CBT packages (Donaldson et al., 2005; Esposito-Smythers et al., 2006), Esposito-Smythers et al. (2011) added a parent training component to create integrated CBT (I-CBT), which includes a variety of individual CBT (e.g., problem-solving), family CBT (e.g., behavioral contracting), and parent training (e.g., monitoring) sessions delivered over 12 months (six months active-weekly sessions, 3 months continuation-biweekly sessions, and 3 months maintenance-monthly sessions). In a small RCT of adolescents with SAs or significant SI and comorbid substance use disorders ($n = 40$), the authors compared I-CBT to enhanced treatment as usual (E-TAU: community-based TAU enhanced with a diagnostic evaluation report and case monitoring). Although both groups' SI decreased over the course of treatment, adolescents receiving I-CBT had significantly fewer SAs over the 18-month study period compared to E-TAU (ITT analyses).

I-CBT is one of the few interventions to report reductions in suicidal *behavior* compared to TAU and there are some notable conclusions from this trial. First, in addition to fewer SAs, the I-CBT group also reported less heaving drinking and marijuana use over the course of treatment. Given that substance use increases risk for suicidal behavior among adolescents (Esposito-Smythers & Spirito, 2004), reductions in alcohol and drug use in the I-CBT group may have been important for treatment efficacy. Second, this version of the treatment package, which included parent training, led to significant reductions in suicidal behavior, whereas previous versions of the intervention (Donaldson et al., 2005; Esposito-Smythers et al., 2006) did not. We will return to these points later when we discuss common elements of efficacious interventions. Finally, it is important to note that, despite low attrition (10% for I-CBT and 15% for E-TAU), there were differences in the treatment dose received: in the I-CBT group, 74% of adolescents, 74% of families, and 90% of parents received 24 adolescent and 12 parent sessions, whereas only 44% of adolescents, 19% of families, and 25% of parents in the comparison condition received this dose. Differences in treatment compliance could be due to the nature of the intervention; that is, perhaps the protocol used in I-CBT is superior for retaining families in treatment compared to E-TAU. Given that so few families received an adequate dose of E-TAU, it is somewhat unclear what I-CBT was compared to in this trial. Despite this limitation, I-CBT was found to be superior to an active control using ITT analyses in an RCT. Therefore, combined individual CBT + family CBT + parent training appears to be a promising intervention and was classified as *Level 2: probably efficacious* for reducing SAs in youth. Of note, I-CBT has only been examined in a sample of suicidal adolescents with comorbid substance use disorders. Replications in more clinically diverse samples are needed.

CBT skills-Group—Rudd and colleagues (1996) examined a time-limited CBT skills group treatment delivered to 264 adolescents and young adults (ages 15-24) in a partial hospitalization setting. The experimental group treatment, consisting of intensive daily (9 hours per day) psychoeducation and skills training groups (e.g., communication, emotion regulation, problem-solving) for two weeks, was compared to TAU (which included both inpatient and outpatient treatment). Youth in both conditions reported significant reductions in SI over the treatment period, but there were no differences between treatment conditions.

Because the group intervention did not demonstrate relative efficacy over TAU, the CBT skills group intervention was evaluated as Level 4: *experimental* for reducing SI in youth.

Dialectical behavior therapy (DBT)

Six studies examined a form of DBT for reducing SITBs in youth. DBT (Linehan, 1993), one of the first treatments to specifically target SITBs, was originally designed to treat adult female patients with borderline personality disorder (BPD), but has since been adapted for adolescents regardless of BPD diagnosis (DBT-A: Miller, Rathus, & Linehan, 1997; Rathus & Miller, 2014). DBT includes an intensive combination of weekly individual therapy, weekly group skills training (i.e., distress tolerance, emotion regulation, interpersonal effectiveness, and mindfulness skills modules), and phone skills coaching with the therapist as needed. The goal of DBT is to help individuals regulate their emotional and interpersonal difficulties in adaptive ways instead of using harmful strategies such as SITBs.

DBT—Five studies (non-randomized controlled trials or pilot studies) have examined some variation of the standard DBT package in youth, including individual sessions, skills groups, and telephone consultation (see Table 2 for details about the dose and length of treatment examined in each trial). Three studies included a standard adolescent-only skills group (James, Taylor, Winmill, & Alfoadari, 2008; James, Winmill, Anderson, & Alfoadari, 2011; Katz, Cox, Gunasekara, & Miller, 2004), whereas two trials delivered skills in a multifamily group format (Fleischhaker et al., 2011; Rathus & Miller, 2002). The three small pilot studies (sample sizes ranged from 12 to 25 adolescents) examining DBT reported significant reductions in DSH (James et al., 2008; 2011) and NSSI (Fleischhaker et al., 2011) over the course of treatment. However, because these studies did not include a control or comparison group, it is unclear whether reductions in SITBs were attributable to DBT. Moreover, these studies included primarily female patients with BPD; further research in more diverse clinical samples is needed to examine whether these treatment effects will generalize to non-BPD adolescents.

Two studies used a non-randomized controlled design to compare DBT-A to psychodynamic or supportive interventions (Katz et al., 2004; Rathus & Miller, 2002). Rathus and Miller (2002) compared 12 weeks of outpatient DBT (individual sessions and multifamily skills groups) to 12 weeks of outpatient TAU (either psychodynamic or supportive therapy) in a large sample of predominantly Hispanic youth ($n = 111$). Fewer adolescents in the DBT group made a SA during treatment than the TAU group, but these group differences were not statistically significant. Adolescents receiving DBT also reported significant reductions in SI from pre- to post-treatment; however, SI was not measured in the TAU usual group post-treatment preventing any between-group analysis. It is important to note that this study reported a relatively high attrition rate – 38% of the DBT group and 60% of the TAU group did not complete the 12-week intervention. In addition, patients were assigned to treatment based on clinical severity with more severe patients referred to DBT.

In a more acute setting, Katz et al. (2004) compared a brief (2-week) DBT package (individual sessions, skills group, and DBT milieu) to psychodynamic psychotherapy (TAU) for 62 adolescents receiving inpatient treatment. DBT and TAU were administered to

patients on two different units. Adolescents in the DBT group had fewer "behavioral incidents" (e.g., self- or other-directed violent episodes) during treatment than those receiving TAU. However, it is unclear how many of these incidents were DSH. Over the 1-year follow-up, both groups reported reduced DSH and SI compared to pre-treatment, but there were no between-group differences.

In summary, no published RCTs have examined the efficacy of DBT in youth (however, see *Clinical Trials in Progress*) and no published studies to date have found that DBT is superior to an active treatment control. Of note, the two controlled trials of DBT examined brief intervention formats (2 and 12 weeks) that are much shorter than the standard one-year DBT package, which may have decreased the potency of the intervention and ability to detect significant treatment effects. Pilot studies using longer DBT interventions (6-12 months) are promising but RCTs are needed before conclusions can be made about DBT's relative efficacy. Based on the existing evidence, DBT was classified as *Level 4: experimental* for SITBs (specifically DSH, NSSI, and SI) in youth.

DBT-Group only—Perepletchikova and colleagues (2011) adapted a DBT skills group only intervention for children ages 8-11. In this initial pilot study, 11 children attended twice weekly skills groups for six weeks and reported significant reductions in SI from pre- to post-treatment. Because there was no control group, it is unclear whether SI reductions were attributable to DBT. Due to limited research on DBT-Group only, this intervention was evaluated as *Level 4: experimental* for SI in youth.

Family-Based Therapy (FBT)

Seven studies were classified as family-based therapy (FBT). These interventions all focused on the family and targeted improvements in family functioning as a means to decrease SITBs. FBTs employed a variety of traditional family therapy components, such as psychoeducation, communication training, and problem-solving. Although all interventions in this category focused on the family, the techniques included in the treatment packages varied. Therefore, FBTs were further categorized based on the primary intervention targets – attachment, parent training only, ecological, problem-focused, or emergency.

FBT-Attachment—Diamond et al. (2010) examined Attachment-Based Family Therapy (ABFT: Diamond et al., 2002), which aims to reduce SITBs by improving family relationships, and especially the parent-adolescent relationship. ABFT uses a variety of process-oriented, emotion-focused, and cognitive-behavioral techniques to enhance the quality of attachment bonds in weekly sessions over a three-month period. In an RCT with 66 adolescents (74% African American) referred from the ED or primary care, patients receiving ABFT reported significantly larger and more rapid reductions in SI over the course of treatment, compared to enhanced TAU (i.e., TAU with referrals and clinical monitoring), and these differences were maintained 12 weeks post-treatment (ITT analyses). Depressive symptoms also declined over the course of treatment but were not specifically examined as a treatment mediator. This study is notable as one of the few to examine, and to find positive effects for, a SITB intervention in a predominantly minority sample of adolescents.

However, several limitations of this study should be noted. First, there were low rates of treatment completion, especially in the TAU group. Though the majority of adolescents attended at least one therapy session, only 69% of the ABFT group and 19% of the control attended six or more therapy sessions, and even fewer attended 10 or more therapy sessions (ABFT: 63%, TAU: 6%). Second, because no behavioral outcomes were compared in this trial, it is unclear whether ABFT is effective for reducing suicidal *behavior* (e.g., SAs). Despite these limitations, ABFT has shown promising effects compared to an active treatment control (RCT using ITT analyses) and therefore FBT-Attachment was classified as Level 2: *probably efficacious* for SI in youth.

FBT-Parent training only—Pineda and Dadds (2013) reported promising findings for a brief (4-session) parent education program for reducing adolescent suicide risk – Resourceful Adolescent Parent Program (RAP-P). RAP-P aims to reduce SITBs by increasing family education about SITBs, enhancing effective parenting, and decreasing family conflict and stress. Because this intervention targeted parents only in treatment (rather than the adolescent and family), RAP-P was categorized on its own as FBT-Parent training only. In a small RCT, 48 adolescents in families receiving RAP-P plus routine care reported less SITBs (i.e., combined measure of DSH and SRB), than adolescents in families receiving routine care only; reductions in SITBs were maintained at six-month follow-up (ITT analyses). Notably, improvements in family functioning fully mediated the treatment effects on SITBs. In addition, treatment compliance for the RAP-P trial was extremely high: 100% of parents in both groups completed the brief (four-session) intervention. Future research would benefit from examining whether RAP-P is efficacious for treating *suicidal* forms of self-injury (e.g., SA), nonsuicidal forms of self-injury (e.g., NSSI), or both. Based on the positive results from the initial RCT examining RAP-P, FBT-Parent training only was classified as Level 2: *probably efficacious* for SITBs in youth.

FBT-Ecological—In contrast to brief interventions that focus only on the parent, more intensive and long-term FBT has also been examined for reducing SITBs in youth: Multisystemic Therapy (MST: Henggeler, Schoenwald, Borduin, Rowland, & Cunningham, 2009) is a home-based family intervention that targets adolescents' problematic behaviors within the multiple systems thought to cause and/or maintain these behaviors. MST was classified as FBT-Ecological because it focuses on systems outside of the family (e.g., peers, school, community) in order to change behavior. In MST, families receive daily contact (if needed) for 3-6 months that focuses on safety planning and risk management, parent skills training, and disengagement from problematic social systems (e.g., peer groups). In a large RCT (*n* = 156), Huey et al. (2004) compared MST to inpatient treatment in a sample of predominantly African American children and adolescents referred for emergency psychiatric hospitalization. Both groups reported reduced rates of SAs from pre-treatment to one-year treatment follow-up, but the MST group reported significantly fewer SAs than the hospitalization comparison group (of note, this difference was only observed via adolescent, but not parent, report).

This study is notable because it is one of the few to examine a SITB intervention in minority youth, who are underrepresented in the treatment literature, and one of two interventions

found to significantly reduce SAs among adolescents (the other being I-CBT: Esposito-Smythers et al., 2011). Although these results appear promising, there are some important limitations of this study. First, adolescents were included if they were at risk of harming themselves *or* others, and only half the sample was identified as at-risk for *self*-harm (due to past SAs or SI). Therefore, this study may not accurately estimate the efficacy of MST for reducing *self*-injurious thoughts and behaviors specifically. Second, although participants were assigned to either MST or hospitalization, and treatment completion rates were high in both groups, 44% of adolescents in the MST treatment group had to be hospitalized during the study due to psychiatric emergencies (but were kept separate from the control group). The high rate of hospitalization suggests that MST was not particularly effective in preventing acute crises. And finally, the suicide reattempt rate was the same in both groups at the follow-up assessment. Reductions over the course of the study could have been greater in the MST group because these adolescents reported more SAs at baseline. Further studies are needed to rule out regression to the mean as a potential explanation for the positive MST findings.

In sum, results from the initial MST trial for SITBs are promising. However, given the limitations of this particular study, FBT-Ecological was classified as Level 3: *possibly efficacious* for reducing SAs in youth.

FBT-Problem-focused—Harrington et al. (1998) examined a family-based intervention that used behavioral (e.g., modeling, behavioral rehearsal) and family therapy techniques (e.g., psychoeducation, communication training) to target family problems hypothesized to contribute to adolescents' DSH (Kerfoot, Harrington, & Dyer, 1995). The brief (five-session) home-based family problem-solving intervention plus routine outpatient care was compared to routine care alone in a large RCT of children and adolescents with recent deliberate self-poisoning (*n* = 162). The FBT was not more effective than the comparison treatment for reducing SI in the total sample, but was somewhat effective for the subset of adolescents without major depressive disorder (33% of the sample). However, given that the depressed adolescents reported more SI at baseline, findings suggest that this brief home-based intervention was not effective for more severely suicidal youth. Based on the overall between-group comparison of treatment efficacy, FBT-Problem-focused was evaluated as Level 4: *experimental* for reducing SI in youth. Of note, this intervention was much briefer than other FBTs that were efficacious for reducing SITBs (e.g., Diamond et al., 2010; Esposito-Smythers et al., 2011). Given the limited research in this area, it is currently unclear whether this treatment was ineffective due to the target of treatment, the dose of the intervention, or both.

FBT-Emergency—The remaining three FBT studies employed even briefer (one-session) interventions in the ED to enhance motivation for change and increase treatment compliance.

First, in a non-randomized controlled trial, Rotheram-Borus and colleagues (1996; 2000) examined a brief (one-session) specialized ED intervention, consisting of psychoeducation, a family-based therapy session (including safety planning and contracting for follow-up treatment), and staff training, to increase outpatient treatment adherence in female suicide

attempters (*n* = 140). Although the initial study reported reduced SI following the specialized ED intervention (Rotheram-Borus et al., 1996), these differences did not hold at any of the follow-up assessments over the subsequent 3-18 months (Rotheram-Borus et al., 2000). There were fewer SAs in the specialized ED group over the 18-month follow-up; however, the low base rate of SAs in the total sample limited power to statistically detect the small between-group differences.

Asarnow et al. (2011a) also examined a brief ED intervention in 181 children and adolescents presenting to the ED with SAs or SI. In an RCT, ED TAU plus staff training was compared to a brief Family Intervention for Suicide Prevention (FISP), which included one family-based CBT session in the ED (including safety planning and contracting for follow-up treatment) plus follow-up telephone contact 48 hours post-discharge and several times over the next month to improve rates of follow-up treatment. Although the intervention increased treatment compliance (for both psychotherapy and medication), there was not a significant reduction in SAs or SI over the subsequent two months compared to ED TAU.

And finally, Ougrin and colleagues (2011; 2013) examined the utility of a one-session family-based ED intervention (i.e., therapeutic assessment), which included motivational enhancement and a cognitive analytic therapy assessment of the adolescent's DSH. The therapeutic assessment was compared to assessment as usual (i.e., psychosocial history and risk assessment) in a sample of 70 adolescents presenting with recent DSH. Similar to the other ED interventions, the therapeutic assessment increased treatment compliance but did not significantly reduce DSH over the two-year follow-up.

Taken together, although these brief ED interventions seem to effectively increase compliance with follow-up care, none of the treatments were more efficacious than TAU for reducing SITBs in youth. Based on these trials, FBT-Emergency interventions were classified as Level 4: *experimental* for reducing DSH, SA, and SI in youth.

Interpersonal psychotherapy (IPT)

IPT-Individual—One study to date has examined individual IPT for adolescents (IPT-A) at risk for SITBs. IPT-A focuses on resolving developmentally appropriate interpersonal problems (e.g., peer pressure, relationships with authority figures) and improving interpersonal functioning to reduce clinical symptoms (Mufson, Moreau, Weissman, & Klerman, 1993). Tang and colleagues (2009) randomized 73 at-risk students with depression to attend intensive IPT-A (IPT-A-IN) in school (two sessions weekly for six weeks) or TAU in school (psychoeducation and supportive counseling for six weeks). Adolescents receiving IPT-A-IN reported greater reductions in SI from pre- to post-treatment compared to those receiving TAU. The treatment group also reported significant reductions in depression, anxiety, and hopelessness over the course of treatment, but it is unclear whether these changes mediated reductions in SI.

Based on positive results from this initial RCT, individual IPT was classified as Level 2: *probably efficacious* for reducing SI in youth. Although promising, it is unclear from this study whether IPT will lead to reductions in suicidal *behaviors* as well as reductions in

suicidal thoughts. In addition, this trial was conducted in a sample of adolescent students with depression; replications in more diverse clinical samples are needed.

Psychodynamic therapy

Psychodynamic therapy-Individual + family—One study in our review examined a psychodynamic intervention for reducing DSH in adolescents – Mentalization-Based Treatment for Adolescents (MBT-A: Rossouw & Fonagy, 2012). MBT-A proposes that DSH is a reaction to interpersonal stress when individuals are unable to mentalize, or understand how their own and others behaviors are related to internal thought and feeling states. Originally developed as a treatment for BPD, the year-long manualized intervention includes weekly individual and monthly family therapy sessions aimed at improving mentalizing skills and self-control to ultimately reduce DSH. In an RCT, Rossouw and Fonagy (2012) compared one year of MBT-A to one year of community-based TAU in a sample of primarily female patients with BPD ($n = 80$). Adolescents in both conditions reported significant declines in DSH over the course of treatment; however, adolescents assigned to MBT-A reported significantly less DSH at the end of treatment compared to TAU (ITT analyses). Improvements in mentalization and reduced attachment avoidance mediated the observed treatment effects.

Although the results of this trial appear promising, the findings should be interpreted in the context of a few limitations. First, attrition rates in both groups were relatively high –50% of the MBT-A group and 58% of the TAU dropped out of treatment during the trial. Second, treatment effects did not emerge until 12 months after treatment initiation (i.e., not during the 3, 6, or 9-month assessments) and a significant percentage of adolescents (56% of the MBT-A group and 83% of the TAU group) still reported engaging in DSH at the end of treatment. Finally, although the modality and duration of treatment were relatively similar across groups, more adolescents in the MBT-A group received family sessions than the TAU group. Despite some notable limitations, Psychodynamic therapy-Individual + Family was found to be superior to an active treatment control in an RCT and was classified as Level 2: *probably efficacious* for reducing DSH in adolescents. Replications in more clinically and demographically diverse samples are needed.

Combined skills group intervention

CBT skills + DBT skills + Psychodynamic therapy skills-Group—Three studies in our review examined a group intervention – Developmental Group Therapy (DGT; Wood, Trainor, Rothwell, Moore, & Harrington, 2001) – that combines skills components from a wide range of theoretical orientations, including CBT, DBT, and psychodynamic group therapy. DGT includes six acute weekly sessions that focus on a range of themes from depression, hopelessness, and self-harm to family and peer relationships. After the acute phase of treatment, long-term booster sessions are provided for as long as needed. The initial RCT, conducted by the developers of the treatment package, reported promising results in a sample of 63 adolescents with a history of DSH (Wood et al., 2001): compared to routine care, adolescents receiving DGT engaged in fewer DSH episodes over the course of treatment (although between-group differences were not significant), were less likely to be DSH "repeaters" (i.e., engage in multiple DSH episodes), and reported that more time

elapsed before the next DSH episode. In terms of dose response, more sessions of DGT were related to less DSH, whereas more sessions of routine care were related to *more* DSH (Wood et al., 2001).

However, these initially promising treatment findings have failed to replicate in other samples of adolescents (Green et al., 2011; Hazell et al., 2009). Both studies compared DGT to routine care in moderate to large samples of adolescents with a history of DSH (*n* = 366: Green et al., 2011; *n* = 72: Hazell et al., 2009). Notably, Hazell et al. (2009) found that adolescents receiving DGT engaged in *more* DSH than those receiving routine care; however, adolescents in the DGT group reported more medication overdoses prior to study initiation, which may have accounted for the higher rates of DSH reported among this group during treatment. Given the mixed results of this group therapy and the potential for contagion of SITBs among groups of adolescents (Prinstein et al., 2010; Walsh & Rosen, 1985), group therapy alone may be contraindicated for this population. Therefore, the combined CBT, DBT, and Psychodynamic skills group intervention was evaluated as Level 5: *questionable efficacy* for reducing DSH in youth.

Other intervention techniques

Five studies in our review examined interventions that focused on increasing adolescents' access to resources and supports. These intervention packages did not fit well into any of the treatment families described above and therefore were classified as "other intervention techniques," divided into Resource interventions-Individual and Support-based interventions.

Resource interventions-Individual—Three studies examined different intervention strategies to increase adolescents' access to resources and improve treatment compliance. None of these interventions were significantly more efficacious than TAU for reducing SITBs in youth. Deykin et al. (1986) examined an intervention package aimed at increasing treatment compliance among disadvantaged (e.g., Medicaid-eligible) youth. The intervention (employed at one site) included direct service (e.g., patient advocacy to increase access to psychiatric, financial, and social resources) plus service provider educational training was compared to TAU (used at another site). Over two years, incidence of ED visits for DSH, SA, and SI were examined at the two sites in 319 adolescents; the direct service intervention was not superior to TAU for reducing SITBs.

Cotgrove et al. (1995) examined a relatively simple intervention that provided adolescents with immediate access to hospital care (via a green card). In an RCT, 105 adolescents with a history of DSH or SAs were assigned to receive the green card intervention or clinic TAU. Although adolescents in the intervention group reported few suicide attempts over the treatment period, these rates were not significantly lower than adolescents receiving standard care. Notably, only 11% of adolescents (*n* = 5) used the green card service during the one-year follow-up; the infrequent use of the intervention limits the conclusions that can be drawn about its relative efficacy.

Finally, Robinson and colleagues (2012) modified a postcard intervention that has previously been effective for reducing SITBs in adults (see Motto, 1976). Adolescents (*n* =

164) were randomly assigned to receive 12 monthly postcards that promoted well-being and use of evidence-based coping skills (additions to the original Motto [1976] postcard intervention) plus community-based TAU, or TAU alone. SITBs decreased for all participants over the 18-month follow-up period, but there were no between-group differences. It is important to note that the original Motto (1976) study examined the postcard intervention in a sample of over 3,000 adults. Robinson et al.'s sample of 164 adolescents may have been underpowered to statistically detect any small effects of this intervention.

Taken together, results from these resource intervention studies suggest that individual-based interventions aimed at increasing access to clinical resources and enhancing treatment compliance are not more effective than TAU for reducing SITBs in adolescents. Based on existing evidence, individual-based resource interventions were classified as Level 4: *experimental* for reducing DSH, SA, and SI in youth.

Support-based interventions—King and colleagues (2006; 2009) examined a support-based intervention for adolescents following hospitalization – Youth-nominated Support Team (YST). YST aims to decrease SITBs by increasing adolescents connections with supportive others who can buffer against stressors in their environment. Adolescents nominate up to four individuals (within or outside their family) who complete psychoeducation sessions about suicide risk and safety planning and are encouraged to maintain weekly supportive contact with the adolescent. The original YST program (YST-I) lasted for 6 months and, in the total sample, was not more efficacious than TAU in reducing SA or SI. Although there was not a main effect of treatment, the YST-I was more efficacious than TAU for reducing SI in girls (King et al., 2006).

In the second iteration of the intervention – YST-II – adolescents were asked to nominate adult supports only (as opposed to peers) who provided support over 3 (rather than 6) months (King et al., 2009). Again there was no main effect of treatment, but YST-II was more efficacious than TAU for reducing SI among adolescents with a history of multiple SAs (King et al., 2009); however, this moderated effect was only significant six weeks into treatment and did not maintain for the rest of treatment or the follow-up period. YST did not significantly reduce the risk of SAs in either study. In addition, it is important to note that, although these RCTs were some of the largest conducted in adolescents with SITBs, the participation rate in the trials was very low (i.e., 35-43% of targeted adolescents were enrolled in the trials) which could limit the effectiveness of these interventions outside of a controlled trial.

Taken together, these studies suggest that support-based interventions are not generally more efficacious than TAU for adolescents with SITBs. These interventions may be useful for specific subgroups of adolescents (e.g., females or multiple attempters); however, further research is needed replicating these moderation effects before firm conclusions can be drawn about the efficacy of YST in these groups. Because there was not a main effect of the experimental treatment, and the moderation results did not replicate across the two studies, the support-based intervention was classified as Level 4: *experimental* for reducing SI in youth.

Clinical trials in progress

Our search of ClinicalTrials.gov generated the following six relevant clinical trials currently in progress or recently completed. Four are RCTs replicating treatments that have demonstrated promising results in previous research. The first RCT (NCT01732601: Intensive Outpatient Services for High-Risk Suicidal Teens, PI: Spirito) will extend the initial promising results for intensive CBT (Esposito-Smythers et al., 2011) by examining the intervention in a larger sample of adolescents ($n = 150$) at high-risk for suicidal thoughts and behaviors (i.e., those with a comorbid mood disorder, and either substance use or self-harm). The second ongoing RCT is comparing Attachment-Based Family Therapy (ABFT) to an active family supportive psychological control (NCT01537419: Attachment Based Family Therapy for Suicidal Adolescents, PI: Diamond & Kobak); this will be the second large-scale RCT to examine this family-based therapy in suicidal adolescents. Two RCTs are evaluating the efficacy of DBT in suicidal adolescents (NCT01528020: Collaborative Adolescent Research on Emotions and Suicide [CARES], PI: Linehan, McCauley, Asarnow, & Berk) or adolescents engaging in DSH (NCT00675129: Treatment for Adolescents With Deliberate Self Harm, PI: Mehlum); these will be the first RCTs of DBT in youth. Positive treatment effects from these RCTs would greatly increase the level of evidence for these interventions.

The fifth trial identified is a multi-center RCT, currently in progress, that is comparing Mindfulness-Based Cognitive Therapy (MBCT), CBT, and TAU (NCT00694668: The [Cost-] Effectiveness of Mindfulness-training and Cognitive Behavioural Therapy in Adolescents and Young Adults with Deliberate Self Harm [DSH], PI: de Klerk & van Giezen); this will be the first study to examine mindfulness-based CBT in suicidal adolescents. Finally, a small, non-randomized pilot study recently examined the efficacy of IPT for adolescents with comorbid depression and NSSI (NCT00401102: Interpersonal Psychotherapy for Depressed Adolescents Engaging in Non-suicidal Self-injury [IPT-ASI], PI: Jacobson). This is the first study to examine IPT for NSSI (Jacobson & Mufson, 2012); however, it appears that only five adolescents completed the treatment and results of the trial have not yet been published.

Summary of Evidence-Based Treatments

Our review of the evidence-based treatment literature for SITBs in youth indicates that there are currently no Level 1: *well-established* treatments for any form of SITB (nonsuicidal or suicidal) among children and adolescents. Level 1 classification requires evidence from at least two independent RCTs indicating that an intervention is superior to an active treatment, psychological placebo, or medication. Most treatments in our review were only examined in a single RCT.

Probably and possibly efficacious interventions

Six treatments were evaluated as Level 2: *probably efficacious* or Level 3*: possibly efficacious* interventions for SITBs in youth. Level 2: *probably efficacious* treatments require evidence from at least one sound RCT indicating superiority to an active treatment, psychological placebo, or medication (rather than waitlist or no treatment controls).

Probably efficacious treatments included: (1) CBT-Individual + CBT-Family + Parent Training for SAs, (2) FBT-Parent training only for SITB (outcome measure combined suicidal and nonsuicidal self-injurious thoughts and behaviors), (3) FBT-Attachment for SI, (4) IPT-Individual for SI, and (5) Psychodynamic therapy-Individual + Family for DSH. It is important to note that the interventions in our review meeting Level 2 criteria were each evaluated in a single RCT: although the initial findings are promising, future studies replicating positive treatment effects are needed to increase confidence in these effects and for the intervention to progress to a *well-established* treatment for SITBs in youth.

In addition to the *probably efficacious* interventions, FBT-Ecological was evaluated as Level 3: *possibly efficacious* for reducing SAs in youth. Promising results from this trial are notable because it is one of two interventions found to significantly reduce suicidal *behavior* specifically in youth. Future research in purely *self*-injurious samples is needed to increase the evidence for this intervention in SITB populations.

It may be surprising that DBT was not classified as an efficacious treatment, given its utility for reducing SITBs in adults (e.g., Linehan, Heard, & Armstrong, 1993; Linehan et al., 2006). However, there are currently no published RCTs examining the efficacy of DBT in youth. As indicated above, favorable results from the RCTs currently in progress would increase the evaluation of DBT from *experimental* (Level 4) to *probably efficacious* (Level 2), or potentially *well-established* (Level 1) if both trials demonstrate that DBT is superior to another active psychological treatment, for adolescent SITBs.

Efficacious treatment components

Our review indicates that efficacious treatments for SITBs in youth are rooted in a wide variety of theoretical orientations, including CBT, FBT, IPT, and psychodynamic therapy. Because no single theoretical orientation is superior, treatment efficacy is likely due to common elements across these interventions (also see review: Brent et al., 2013). In general, efficacious treatments: (1) target relationship or interpersonal functioning, particularly within the family (and almost all include the family or parents in treatment), (2) involve skills training, (3) are intensive (specifically interventions that reduced self-injurious *behavioral* outcomes), and (4) address other maladaptive behaviors, or risk factors for, SITBs (specifically interventions found to reduce SAs). These components are addressed in turn below.

First, efficacious interventions all focused on improving some aspect of relationship or interpersonal functioning. Given that family problems and interpersonal difficulties are commonly reported reasons for suicidal behavior among adolescents (Cotgrove et al., 1995; Wagner, Silverman, & Martin, 2003), improving familial and interpersonal functioning may be particularly important for reducing further SITBs in this population. Most efficacious interventions targeted familial relationships specifically. Family sessions in CBT, FBT, and psychodynamic therapy focused on improving the parent-adolescent relationship or family functioning using psychoeducation, communication training, and/or problem-solving skills training. Moreover, two of the efficacious interventions found that improvements in family functioning (Pineda & Dadds, 2013) and attachment (Rossouw & Fonagy, 2012) mediated positive treatment effects. The individual IPT intervention, delivered to students in a school

setting, was the only treatment that did not include a formal family component. However, IPT does highlight the importance of interpersonal effectiveness and ameliorating interpersonal problems to improve psychological functioning (Mufson et al., 1993). Taken together, this research indicates that improving family functioning specifically, or interpersonal functioning more broadly, is an important component of efficacious treatments.

Second, all efficacious treatments included at least one skills training component, such as emotion regulation, problem-solving, or interpersonal effectiveness skills. The necessity of skills training for treatment success may explain why resource interventions, which increase access to mental health resources and social support but do not include any formal skills training, have not been effective for reducing SITBs in youth. However, it is unclear from this review *which* skills are the most important for effective treatment. Family-based and CBT interventions included a range of emotion regulation, problem-solving, and conflict management skills, whereas psychodynamic and interpersonal interventions focused primarily on skills training in one area (affect regulation and interpersonal problem-solving, respectively). Despite differences in skills training, a number of these interventions demonstrated some promise for reducing SITBs. The field would benefit from future research identifying the individual, parent, and family skills necessary for treatment efficacy.

Notably, our review suggests that parent skills training may be a particularly important component of efficacious treatments for SITBs in youth. The series of studies by Esposito-Smythers and colleagues provide the strongest evidence for the role of parenting skills. The initial individual CBT intervention developed by this group (Donaldson et al., 2005) was not more effective than supportive therapy for reducing SITBs. When family sessions were added to the intervention, significant reductions in SI, but not SAs, were found (although this could be due to the small sample size in this pilot study: Esposito-Smythers et al., 2006). It was not until parent training was added to the treatment package in I-CBT that significant reductions in SAs were observed (Esposito-Smythers et al., 2011). Other efficacious interventions also included parenting components, such as a parent education and training in RAP-P and MST. The importance of parent training may help explain why some brief family-based interventions were effective, whereas others were not: short-term (4-5 session) parent training in the RAP-P trial reduced SITBs, but very brief (one-session) family interventions that focused primarily on family problem-solving did not. Further support for parent training as a mechanism of change comes from a classroom-based prevention trial indicating that behavior management strategies in childhood may reduce SI over adolescence and young adulthood (Wilcox et al., 2008).

Third, the most effective interventions for reducing self-injurious *behaviors* (i.e., DSH or SAs) are intensive (i.e., greater number of weekly contacts and longer length of treatment), especially in the beginning of treatment. Notably, none of the brief family-based or resource interventions were effective for reducing SITBs. Given that adolescents are most at risk shortly after hospital discharge (e.g., Goldston et al., 1999), early intensive intervention may be necessary to provide a sufficient treatment dose during this high-risk period.

Finally, it may also be important to target other maladaptive behaviors, or risk factors for SITBs, in treatment. For instance, in the most promising intervention study for SITBs in youth, Esposito-Smythers et al. (2011) found that, in addition to reductions in SAs, the treatment group also reported less substance use over the course of treatment. (Of note, this particular trial recruited participants for comorbid suicide risk and substance use disorders, and provided treatment for both symptoms.) Findings from this study suggest that targeting risk factors for SITBs, such as substance use, may enhance interventions. However, it is important to note that this is not true for all risk factors: interventions that reduce depression do not decrease SITBs in youth (Asarnow et al., 2011b; Gibbons, Brown, Hur, Davis, & Mann, 2012; Wilkinson et al., 2011). In addition to general risk factors, future research is needed to elucidate the specific mechanisms that cause and maintain SITBs over time, so these factors can be targeted in treatment (see *Future Research Directions*).

Considerations when evaluating treatment efficacy

There are a number of important issues to consider when evaluating the treatments reviewed here, including the: (1) SITB outcome(s), (2) comparison or control condition, (3) general decline in SITBs over time, (4) single trials used to evaluate most treatment families, and (5) high attrition rates as well as low, and differential, rates of treatment dose. Each of these issues is considered in more detail below.

When comparing the efficacy of interventions, it is important to note the variety of SITB outcomes examined. In this review, we identified 10 different SITB outcomes that ranged from specific behavioral outcomes, such as NSSI (rarely examined) and SAs, to broader outcomes, such as DSH (which includes both nonsuicidal and suicidal behaviors) and terms that collapsed suicidal thoughts, plans, threats, and attempts into a single category (e.g., suicide events). Moreover, the SITB outcomes for the *probably efficacious and possibly efficacious* treatments varied across studies. Some interventions were effective for reducing SI only (FBT-Attachment, IPT-Individual), DSH (Psychodynamic therapy-Individual + Family), SAs (CBT-Individual + CBT-Family + Parent Training, FBT-Ecological), or SITBs more broadly (FBT-Parent training only). The difference in SITB outcomes assessed is important for a few key reasons. First, it is difficult to compare treatment outcomes across studies because different SITBs were examined using a variety of measures. Second, for studies that included more vague outcomes, such as DSH or SITBs (which includes both suicidal and nonsuicidal thoughts and behaviors), it is unclear whether these interventions are efficacious for reducing nonsuicidal forms of self-injury, suicidal forms of self-injury, or both. Researchers often collapse multiple SITB outcomes into a single category because these behaviors are relatively infrequent in the population and therefore large sample sizes are necessary to examine a single form of SITB. Although combining different forms of SITB makes sense for practical reasons, these broad categories limit our understanding of treatment effects. Finally, many studies examined, and found positive treatment effects for, suicidal thoughts. Although SI is concerning, not all adolescents with suicidal thoughts will engage in suicidal behaviors (Nock et al., 2008; Nock et al., 2013). Moreover, given that a history of SAs (rather than other SITBs) is currently the most robust risk factor for *completed* suicide (Goldsmith, Pellmar, Kleinman, & Bunney, 2002), it will be important for future research to examine interventions that specifically target suicidal *behavior*.

Second, a range of control or comparison conditions were also used across trials, making it difficult to interpret the consistency of treatment effects across studies. Although treatment as usual (TAU) is the most frequently employed comparison condition, the nature of the usual care provided ranges and is often not described in great detail. In a sample of 63 adolescents receiving TAU, Spirito, Stanton, Donaldson, and Boergers (2002b) found that treatments varied widely in theoretical orientation (cognitive, behavioral, psychodynamic) and frequency of sessions (Range: 0-22). Consistent with Spirito et al. (2002b), TAU in the current review varied from supportive counseling (Tang et al., 2009) to inpatient hospitalization (Huey et al., 2004). Of course, the appropriate comparison treatment will depend on the severity of the sample, with more severe patient samples requiring more intensive control treatments than less severe groups. However, as Spirito et al. (2002b) noted, the increased monitoring and resources available in RCTs may make less intensive interventions clinically appropriate for even severe samples of adolescents. We will return to this issue in our discussion of future research.

Third, in most studies reviewed, SITBs tended to decrease markedly over time, even without intervention. Given this natural decline, or regression to the mean, pilot studies, which lack a control or comparison group, are of limited utility for evaluating an intervention's efficacy. In the current review, RCTs were weighted more heavily than pilot studies, which resulted in a less favorable evaluation of interventions that have primarily been examined in non-controlled studies.

Fourth, most treatments, and particularly the more efficacious treatments, were only examined in a single trial and, therefore, evaluations are based on the efficacy of an intervention in one specific sample. For instance, both IPT-Individual and FBT-Parent training only interventions were examined in adolescents with depression, and I-CBT (CBT-Individual + CBT-Family + Parent Training) was examined in adolescents with substance use disorders. Replications of promising treatments in more diverse samples are needed before conclusions can be made about the generalizability of treatment findings.

Finally, high attrition rates and poor treatment attendance were major problems in many of the trials reviewed. These issues made it difficult to evaluate the efficacy of some experimental interventions: if a large percentage of the treatment and/or control group dropped out of the trial, or there were differences in the dose of treatment between conditions, this limited the inferences that could be drawn about a specific treatment approach. Moreover, low rates of treatment completion are important when considering how these interventions will work in naturalistic settings (i.e., moving from efficacy to effectiveness studies).

Future Research Directions

Improvement in study design and measurement

A major shortcoming of the treatment literature in this area is the lack of experiments or RCTs. As discussed above, RCTs are essential for establishing the efficacy of an intervention, and multiple independent RCTs are necessary for a treatment to be considered *well-established*. Moreover, our review indicates that pilot studies are of limited utility given

the episodic nature of SITBs. Future research also would benefit from studies that include: specific SITB outcomes, more detail about the intervention components included in both the experimental and comparison treatment packages, and greater standardization of usual care conditions across trials.

Replication and dismantling studies of promising treatments

Replication is vital to confirm the efficacy of an intervention. For instance, although Wood et al. (2001) initially reported promising results of DGT, attempts to replicate these findings by other research groups were unsuccessful (Green et al., 2011; Hazell et al., 2009). Given that *well-established* treatments require at least two independent RCTs, one straightforward, but vitally important, future direction is for independent research teams to examine the efficacy of the *probably efficacious* treatments identified in this review. In addition, it will be important for future studies to examine the efficacy of these treatments in various sociodemographic and clinical groups (since most have only been examined in one specific sample of adolescents). Although obtaining grant funding for replication studies can be difficult, researchers can enhance the incremental utility of replications by building in tests of additional factors, such as testing mediators or moderators of change.

In addition, the field would benefit from future research examining whether some or all intervention components included in potentially efficacious treatments are necessary to produce significant treatment effects. The current interventions demonstrating the most promise for reducing SAs in youth are intensive and include a variety of treatment elements. Dismantling studies could be helpful for identifying the components essential for treatment efficacy. For instance, Esposito-Smythers et al. (2011) found that parent training enhanced their CBT package. Relatedly, Pineda and Dadds (2013) reported positive effects for a parent education intervention that did not include the adolescent in treatment. Future research is needed to examine the treatment efficacy of parent training and education alone for reducing suicidal *behavior* in youth.

Examination of treatment mediators and moderators

It will also be important for future studies to examine *how* (mediation) these interventions work and for *whom* (moderation). A few family-based treatment studies have identified significant mediators of treatment outcome. For instance, increased family functioning mediated positive treatment effects in the RAP-P trial (Pineda & Dadds, 2013), and improvements in mentalization and attachment mediated positive outcomes for MBT-A (Rossouw & Fonagy, 2012). These findings provide support for the proposed mechanisms of change in these trials.

In addition, it will be important for future research to highlight potential moderators of treatment effects, as not all interventions will work for all individuals (Kraemer, Wilson, Fairburn, & Agras, 2002). Some studies in our review reported that their intervention only worked for some participants (e.g., Harrington et al. 1998). However, because there was no main effect of treatment, it is unclear whether these findings reflect true moderation.

Development of effective brief interventions

Treatments demonstrating the most promising results for reducing self-injurious *behaviors* (e.g., SAs) in adolescents are intensive and long-term. However, given that adolescents (and adults) are at greatest risk for attempting suicide in the six months following hospital discharge (Brent et al., 1993; Goldston et al., 1999; Prinstein et al., 2008), long-term interventions may be inadequate for helping adolescents during these high-risk periods. For instance, in the TASA trial, 40% of SE occurred within the first month of the study before a sufficient dose of treatment could be delivered (Brent et al., 2009). Unfortunately, the brief (resource) interventions examined to date, including crisis management and increasing hospital access, have not proven effective for reducing SITBs in adolescents.

Safety planning is one potential brief treatment that is being used increasingly in a variety of clinical settings, and specifically within the United States Department of Veterans Affairs Healthcare System (Stanley & Brown, 2012). Through a series of six steps, safety planning helps patients identify: warning signs for distress, coping skills, social supports, clinical resources, and ways to restrict access to lethal means. The safety planning intervention (SPI) is designed to be unique as a single-session, stand-alone treatment for individuals at risk for suicide (Stanley & Brown, 2012). Although potentially promising as a brief intervention, there is currently no empirical evidence documenting safety planning's efficacy for reducing SITBs in adults or adolescents. However, there is data indicating that restricting access to lethal means, such as firearms, can decrease SAs using that particular method (Brent & Bridge, 2003). Future research should focus on examining other brief interventions that may be useful for reducing risk for SITBs during early high-risk periods.

Utilization of single-case experimental designs

Although large-scale RCTs are necessary to ultimately evaluate an intervention as *well-established*, they are not the only designs useful for treatment research. In fact, large trials that require hundreds of participants (to have enough power to detect effects) may actually be inappropriate for testing novel treatments with unknown efficacy. Single-case experimental designs (SCEDs: Barlow, Nock, & Hersen, 2009) are one alternative to RCTs that may be particularly ideal for developing new treatments for SITBs. In contrast to RCTs that examine treatment effects on target outcomes *between* individuals, SCEDs examine the impact of treatment on targets *within* individuals (e.g., Wallenstein & Nock, 2007). SCEDs may be particularly useful for developing new interventions that can later be examined in standard RCTs.

Concluding Comments

Although research on interventions for SITBs has increased over the past 10 years, there are currently no *well-established* treatments for suicidal or nonsuicidal SITBs in youth. Several treatments have shown potential promise: interventions identified as efficacious include treatment components that foster familial and other interpersonal relationships, improve parenting skills, and strengthen individual coping skills. Most of these interventions are intensive and focus on treating both the family as well as the adolescent. However, these conclusions are based on a single RCT per treatment and it is unclear which intervention

components are necessary and sufficient for reducing SITBs. Future research is needed: to replicate promising treatments, to isolate essential treatment components, to determine how these treatments work (i.e., mediators), as well to identify which adolescents will benefit most from these interventions (i.e., moderators). In addition, given that adolescents are at heightened suicide risk shortly after discharge from the hospital, the field needs brief interventions that can be administered within the month post-discharge.

Due to the paucity of established treatments for SITBs, treatment providers may find it useful to refer to evidence-based clinical guidelines for working with suicidal youth, such as those provided by the Council of the American Academy of Child and Adolescent Psychiatry (AACAP Official Action, 2001). These guidelines provide information regarding clinical assessment, crisis management, and hospitalization for suicidal youth. Given the increasing treatment research in this area, it is our hope that the next edition of this review will be able to discuss *well-established* treatments for effectively reducing SITBs in children and adolescents.

Acknowledgments

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Table 1
JCCAP Evidence-Base Updates EBT Evaluation Criteria

Methods criteria:

1   Group design: Study involved a randomized controlled design

2   Independent variable defined: Treatment manuals or logical equivalent were used for the treatment

3   Population clarified: Conducted with a population, treated for specified problems, for whom inclusion criteria have been clearly delineated

4   Outcomes assessed: Reliable and valid outcome assessment measures gauging the problems targeted (at a minimum) were used

5   Analysis adequacy: Appropriate data analyses were used and sample size was sufficient to detect expected effects

Level 1: Well-Established Treatments

Evidence criteria

1.1 Efficacy demonstrated for the treatment in at least two (2) independent research settings and by two (2) independent investigatory teams demonstrating efficacy by showing the treatment to be either:

1.1.a. Statistically significantly superior to pill or psychological placebo or to another active treatment

OR

1.1.b. Equivalent (or not significantly different) to an already well-established treatment in experiments

AND

1.2 All five (5) of the Methods Criteria

Level 2: Probably Efficacious Treatments

Evidence criteria

2.1 There must be at least two good experiments showing the treatment is superior (statistically significantly so) to a wait-list control group

OR

2.2 One or more good experiments meeting the Well-Established Treatment level with the one exception of having been conducted in at least two independent research settings and by independent investigatory teams

AND

2.3 All five (5) of the Methods Criteria

Level 3: Possibly Efficacious Treatments

Evidence criterion

3.1 At least one good randomized controlled trial showing the treatment to be superior to a wait list or no-treatment control group

AND

3.2 All five (5) of the Methods Criteria

OR

3.3 Two or more clinical studies showing the treatment to be efficacious, with two ore more meeting the last four (of five) Methods Criteria, but none being randomized controlled trials

Level 4: Experimental Treatments

Evidence criteria

4.1. Not yet tested in a randomized controlled trial

OR

4.2. Tested in 1 or more clinical studies but not sufficient to meet level 3 criteria.

Level 5: Treatments of Questionable Efficacy

5.1. Tested in good group-design experiments and found to be inferior to other treatment group and/or wait-list control group (i.e., only evidence available from experimental studies suggests the treatment produces no beneficial effect).

Note. Criteria adapted from: Silverman and Hinshaw (2008) and Division 12 Task Force on Psychological Interventions' reports (Chambless et al., 1998), Chambless and Hollon (1998), and Chambless and Ollendick (2001). For description of criteria for methodology: see Chambless and Hollon (1998).

Table 2

Interventions for Self-injurious Thoughts and Behaviors in Youth.

Authors	Sample Size	Sample Characteristics	Setting	Inclusion (In) and Exclusion (Ex) Criteria	Major Diagnoses	Outcomes/ Measures	Treatment Conditions, Dose, and Assessments	Study Type	Study Attrition Rate (and Treatment Completion)	Main Results
Cognitive-Behavioral Therapy (CBT):										
CBT-Individual[1]										
Donaldson, Spirito, & Esposito-Smythers (2005)	39	12-17 year-olds; 82% female; 85% Caucasian, 10% Hispanic, 5% African American	Outpatient	In: Presented to ED or inpatient with SA; Ex: Psychosis, severe intellectual impairment	CUD (45%), DBD (45%), MDD (29%), AUD (19%)	SA (structured follow-up interview; Spirito et al., 1992), SI (SIQ)	T: Skills-Based Treatment ($n = 21$), C: Supportive Relationship Treatment ($n = 18$), Dose: Six acute individual sessions and one adjunct family problem-solving session over 3 months + three monthly individual sessions; Assessments: Pre-treatment, F/u 3 and 6 months	RCT	T: 29%; C: 11%; F/u Total sample: 20% *Treatment completion:* 6 sessions: 77%; full treatment: 60%	Reduced SI for both groups over treatment, but NS between groups; NS for SA
Taylor et al. (2011)[2]	25	12-18 year-olds; gender and ethnicity NR	Outpatient	In: ≥1 episode of DSH; Ex: ASD, psychosis, global learning disability, unwillingness to address DSH	NR	DSH (SHI)	T: Individual Manualized CBT (MCBT) for DSH ($n = 25$), Dose: 8-12 individual sessions + optional 3-session parent psychoeducation group ($M = 6$ months); C: None; Assessments: Pre- and post-treatment, F/u 3 months	Pilot	T: 36% *Treatment completion:* 64%	Reduced DSH over treatment and maintained at F/u
CBT-Individual + CBT-Family										
Brent et al. (2009)	124	12-18 year-olds; 77% female; 67% Caucasian, 19% Hispanic, 13% African American	Outpatient	In: SA within past 90 days, UMD, moderate depressive symptoms; Ex: BP, PDD, SUD, psychosis	UMD (100%)	SE (SSRS)	T1: CBT for Suicide Prevention (CBT-SP), Dose: acute 12-16 weekly individual sessions and up to 6 family sessions + continuation 6 individual sessions and up to 3 family sessions ($n = 17$); T2: Medication algorithm ($n = 14$); T3: Combined CBT-SP + medication ($n = 93$); Length for all Ts: 6 months; Assessments: Pre-treatment and at 6, 12, 18, and 24 weeks	Non-randomized controlled trial	Total sample Week 12: 23%, Week 18: 30%, Week 24: 33% *Treatment completion:* T1: 65%, T2: 57%, T3: 71%	NS for SE
Esposito-Smythers, Spirito, Uth, & LaChance (2006)[2]	6	14-16 year-olds; 83% female; 100% Caucasian	Outpatient	In: Inpatient hospitalization for SA or SI and comorbid AUD or CUD; Ex: SUD other than AUD or CUD, IQ < 70	100% AUD/CUD and MDD	SA (NR), SI (SIQ-Sn)	T: CBT for suicide and AUD/CUD ($n = 6$); Dose: weekly individual sessions for 6 months + biweekly individual sessions for 3 months + monthly individual sessions 3 months + conjoint family sessions as	Pilot	T: 17% *Treatment completion:* 83%	Reduced SI; NS for SA

Authors	Sample Size	Sample Characteristics	Setting	Inclusion (In) and Exclusion (Ex) Criteria	Major Diagnoses	Outcomes/Measures	Treatment Conditions, Dose, and Assessments	Study Type	Study Attrition Rate (and Treatment Completion)	Main Results
							needed; C: None; Assessments: Pre-treatment, 6 and 12 months			
							needed; C: None; Assessments: Pre-treatment, 6 and 12 months			
CBT-Individual + CBT-Family + Parent Training										
Esposito-Smythers, Spirito, Kahler, Hunt, & Monti (2011)[2]	40	13-17 year-olds; 67% female; 89% Caucasian, 14% Hispanic	Outpatient	In: SA in past 3 months or significant SI (≥41 on SIQ) and AUD or CUD; Ex: BP, psychosis, current homicidal ideation, SUD other than AUD or CUD, IQ < 70	UMD (94%), CUD (83%), AUD (64%), ANX (56%), DBD (50%)	SA (K-SADS-PL), SI (SIQ-Sn)	T: Integrated CBT for AUD/SUD and suicide (n = 20); Dose: Weekly individual and weekly-biweekly parent sessions for 6 months + biweekly individual and biweekly-monthly parent sessions for 3 months + monthly individual and parent monthly as needed for 3 months + conjoint family sessions as needed; C: Enhanced TAU – diagnostic evaluation + community-based TAU (n = 20); Dose: Varied for 12 months; Assessments: Pre-treatment, 3, 6, 12, and 18 months	RCT	T: 25%; C: 15%; Total sample 3 months: 10%; 6 months: 15%; 12 months: 18%; 18 months: 20%; *Treatment completion* (24 sessions w/ adolescent and 12 sessions w/ parent): T: 74% adolescents, 74% families, and 90% parents, C: 44% adolescents, 19% families, and 25% parents	Reduced SA in T compared to C over 18 months; NS for SI
CBT skills-Group										
Rudd et al. (1996)	264	15-24 year-olds; 18% female; 61% Caucasian, 26% African American, 11% Hispanic	Partial outpatient	In: Presented with SA, UMD with SI, alcohol abuse with SI; Ex: SUD or chronic abuse, psychosis or thought disorder, severe PD	MD (72%), AUD (44%)	SA (measure NR), SI (MSSI)	T: Time-limited CBT group therapy (n = 143); Dose: 9 hours daily for 2 weeks; C: Inpatient and outpatient TAU (n = 121), Dose: Varied combination of individual and group therapy; Assessments: Pre-treatment, F/u 1, 6, 12, 18, and 24 months	RCT	F/u: 1 month: T: 16%, C: 25%; 6 months: T: 47%, C: 54%; 12 months: T: 68%, C: 79%; *Treatment completion:* T: 79%	Reduced SI for both groups, but NS between groups; not enough SAs to examine group differences
Dialectical Behavior Therapy (DBT):										
DBT[3]										
Fleischhaker et al. (2011)[4]	12	13-19 year-olds; 100% female; ethnicity NR	Outpatient	In: NSSI or SA past 4 months, and BPD or 3 BPD criteria; Ex: AN/BN, SUD, psychosis, severe mood episode requiring inpatient	BPD (83%)	NSSI and SA (LPC)	T: DBT (n = 12), Dose: Weekly individual sessions + weekly multifamily skills group (+ regular phone contact as needed) for 16-24 weeks; C: None;	Pilot	F/u T: 0%; *Treatment completion:* 75%	Reduced NSSI from pre-treatment to F/u 4 weeks post-treatment, F/u 1 year over half still engaging in NSSI;

Authors	Sample Size	Sample Characteristics	Setting	Inclusion (In) and Exclusion (Ex) Criteria	Major Diagnoses	Outcomes/ Measures	Treatment Conditions, Dose, and Assessments	Study Type	Study Attrition Rate (and Treatment Completion)	Main Results
				treatment, IQ < 70, illiteracy treatment, IQ < 70, illiteracy			Assessments: Pre-treatment, F/u 4 weeks and 1 year post-treatment			No SAs reported during trial
James et al. (2008)	16	15-18 year-olds; 100% female; ethnicity NR	Outpatient	In: DSH > 6 months; Ex: ASD, BP, SZ, moderate to severe mental impairment	BPD (100%)	DSH (unspecified clinical interview)	T: DBT (n = 16), Dose: Weekly individual sessions + weekly skills group + telephone consultation for two 6-month blocks; C: None; Assessment: Pre- and post-treatment, F/u 8 months	Pilot	T: 13% *Treatment completion:* (78% of sessions completed, on average)	Reduced DSH from pre- to post-treatment and F/u
James, et al. (2011)	25	13-17 year-olds; 88% female; ethnicity NR	Outpatient	In: DSH > 6 months; Ex: ASD, BP, SZ, moderate to severe mental impairment	BPD (100%)	DSH (unspecified clinical interview)	T: DBT (n = 25), Dose: Weekly individual sessions + weekly skills group + telephone consultation for two 6-month blocks; C: None; Assessments: Pre- and post-treatment	Pilot	T: 28% *Treatment completion:* 72%	Reduced DSH from pre- to post-treatment
Katz et al. (2004)	62	14-17 year-olds; 84% female; 73% Caucasian	Inpatient	In: Hospitalization for SA or SI; Ex: BP, mental disability, psychosis, severe learning difficulties	NR	DSH during treatment (incident reports from nursing staff), DSH at F/u (LPC), SI (SIQ)	T: DBT (n = 32), Dose: 10 daily skills group + twice weekly individual sessions + DBT milieu for 2 weeks; C: Psychodynamic psychotherapy (n = 30), Dose: Daily group sessions + weekly individual sessions + psychodynamic milieu; Assessments: Pre- and post-treatment, F/u 1 year	Non-randomized controlled trial (treatment assigned by unit)	F/u T: 17%, C: 10% *Treatment completion:* 100%	Fewer behavioral incidents (e.g., violence toward self or others-DSH not specified) in T group; Reduced DSH and SI in both groups at F/u, NS differences between groups
Rathus, & Miller (2002)[4]	111	16.1 years old ± 1.2 (T), 15.0 years old ± 1.7 (C); 93% female (T), 73% female (C); 68% Hispanic, 17% African American, 8% Caucasian	Outpatient	In: SA in past 16 weeks or current SI, and BPD or ≥ 3 BPD features; Ex: NR	UMD (T: 92%, C: 73%), BPD (T: 88%, C: 16%), ANX (T: 40%, C: 21%), SUD (T: 48%, C: 5%)	SA (patient self-report to therapist), SI (HASS and SSI)	T: DBT (n = 29), Dose: Twice weekly individual sessions + multifamily skills group for 12 weeks; C: Psychodynamic or supportive therapy (n = 82), Dose: Twice weekly individual + family sessions for 12 weeks; Assessments: Pre- and post-treatment	Non-randomized controlled trial (more severe patients assigned to DBT)	Varies for analyses (e.g., 90% T and 50% C completed baseline SSI; 34% T completed pre- and post-treatment measures) *Treatment completion* (12 weeks): T: 62%, C: 40%	Reduced SI in T group pre- to post-treatment (not measured in C group; therefore not able to compare between groups); NS for SA

DBT-Group only

Authors	Sample Size	Sample Characteristics	Setting	Inclusion (In) and Exclusion (Ex) Criteria	Major Diagnoses	Outcomes/ Measures	Treatment Conditions, Dose, and Assessments	Study Type	Study Attrition Rate (and Treatment Completion)	Main Results
Perepletchikova et al. (2011)	11	8-11 year-olds; 55% female; 73% Caucasian	School	In: 2nd-6th graders; Ex: NR	MDD symptoms (55%), ANX symptoms (45%;)	SI (MFQ)	T: DBT group skills (n = 11), Dose: Twice weekly for 6 weeks; C: None; Assessments: Pre- and post-treatment	Pilot	NR	Reduced SI from pre- to post-treatment

Family-Based Therapy (FBT):

FBT-Attachment

Authors	Sample Size	Sample Characteristics	Setting	Inclusion (In) and Exclusion (Ex) Criteria	Major Diagnoses	Outcomes/ Measures	Treatment Conditions, Dose, and Assessments	Study Type	Study Attrition Rate (and Treatment Completion)	Main Results
Diamond et al. (2010)	66	12-17 year-olds; 83% female; 74% African American	Outpatient	In: SI (> 31 on SIQ-Jr) and moderate depression; Ex: Needed psychiatric hospitalization, recent discharge from psychiatric hospital, psychosis, mental retardation or borderline intellectual functioning	ANX – not specified (67%), ADHD or DBD (58%), MDD (39%)	SI (SIQ-Jr and SSI)	T: Attachment-Based Family Therapy (*n* = 35), Dose: Weekly sessions for 3 months; C: Enhanced TAU (*n* = 31); Dose: Varied outpatient treatment with clinical monitoring; Assessments: Pre-treatment, 6 weeks, 12 weeks (post-treatment), and 24 weeks	RCT	6 weeks T: 6%, C: 13%; 12 weeks (post-treatment) T: 11%, C: 6%; 24 weeks T: 11%, C: 16%; *Treatment completion:* 1 session: T: 91%, C: 68%; 6 sessions: T: 69%, C: 19%; 10 sessions: T: 63%, C: 6%	Reduced SI in T compared to C and maintained at F/u

FBT-Ecological

Authors	Sample Size	Sample Characteristics	Setting	Inclusion (In) and Exclusion (Ex) Criteria	Major Diagnoses	Outcomes/ Measures	Treatment Conditions, Dose, and Assessments	Study Type	Study Attrition Rate (and Treatment Completion)	Main Results
Huey et al. (2004)	160	10-17 year-olds; 35% female; 65% African American, 33% Caucasian	Home (T); Inpatient (C)	In: Hospitalization for SA, SI or SP, homicidal ideation or behavior, psychosis, threat to harm self or others; Medicaid-funded or without health insurance, residing in non-institutional environment; Ex: ASD	NR	DSH or SA (CBCL); SA (YRBS); SI (BSI and YRBS)	T: Multisystemic Therapy (*n* = 80), Dose: Daily contact if needed for 3-6 months; C: Inpatient hospitalization (*n* = 80), Dose: Daily behaviorally-based milieu program; Assessments: Pre-treatment, 4 months, F/u 1 year post-treatment	RCT	Total sample: 2% *Treatment completion:* T: 94%; C: 100%	Reduced SAs from pre- to post-treatment in T compared to C (YRBS only); NS for SI

FBT-Emergency

Authors	Sample Size	Sample Characteristics	Setting	Inclusion (In) and Exclusion (Ex) Criteria	Major Diagnoses	Outcomes/ Measures	Treatment Conditions, Dose, and Assessments	Study Type	Study Attrition Rate (and Treatment Completion)	Main Results
Asarnow et al. (2011)	181	10-18 year-olds; 69% female; 45% Hispanic, 33% Caucasian, 13% African American	ED	In: Presented to ED with SA and/or SI; Ex: Psychosis; symptoms or other factors that interfered with ability to consent	UMD (40%)	SA (DISC-IV and HASS), SI (HASS)	T: Family Intervention for Suicide Prevention (*n* = 89), Dose: One family-based CBT session in ED + phone contact 48 hours post-charge and several other times over 1 month; C: Enhanced ED TAU (*n* = 92), Dose: ED usual care + specialized staff training; Assessments: Pre-treatment, F/u 2 months	RCT	F/u T: 15%; C: 9% *Treatment completion:* 100%	NS between groups for all SITBs outcomes
Ougrin, Boege, Stahl, Banarsee, & Taylor (2013)[2]	70	12-18 year-olds; 80% female; 53% Caucasian, 20% African American, 11% Asian	ED	In: Recent DSH or DSP but not currently receiving psychiatric services; Ex: gross reality distortion,	EMD (60%); DBD (13%)	DSH (Accident and Emergency department reports and patient records)	T: Therapeutic Assessment (*n* = 35); Dose: 30-minute session using cognitive analytic therapy paradigm with family + assessment as usual (AAU); C:	RCT	F/u T: 6%, C: 9% *Treatment completion:* 100%	NS between groups for DSH over F/u

Authors	Sample Size	Sample Characteristics	Setting	Inclusion (In) and Exclusion (Ex) Criteria	Major Diagnoses	Outcomes/ Measures	Treatment Conditions, Dose, and Assessments	Study Type	Study Attrition Rate (and Treatment Completion)	Main Results
				severe intellectual disability: imminent violence or severe intellectual disability: imminent violence or severe intellectual disability: imminent violence or severe intellectual disability: imminent violence or		suicide risk suicide risk suicide risk suicide risk	AAU (n = 35); Dose Psychosocial history and risk assessment over 1 hour; Assessments: F/u 2 years			
Rotheram-Borus et al. (1996; 2000)	140	12-18 year-olds; 100% female; 88% Hispanic	ED	In: Presented to ED with SA, female gender; Ex: > 1 week psychiatric hospitalization	UMD (44%), ANX (38%), DBD (24%)	SA (ED records), SI (HASS)	T: Specialized ED Care, Dose: Psychoeducation + family session + staff training (n = 65); C: Standard ED Care (n = 75); Dose: ED evaluation and referral to outpatient therapy; Assessments: Pre- and post-treatment, F/u 3, 6, 12, and 18 months	Non-randomized controlled trial	F/u Total sample: 8% *Treatment completion:* 100%	Greater reduction in SI in T compared to C post-intervention; however, NS between groups for all SITBs outcomes at F/u
FBT-Parent training only										
Pineda & Dadds (2013)	48	12-17 year-olds; female: 73% (T); 78% (C); Caucasian: 64% (T), 50% (C); Mixed ethnicity: 27% (T) 44% (C)	Outpatient	In: ≥ 1 SITBs past two months; primary ANX or MDD; Ex: PDD or psychosis	MDD (100%); ANX (38%)	SITBs (combines all DSH and SRB) (ASQ-R)	T: Resourceful Adolescent Parent Program (RAP-P) (n = 24); Dose: Four 2-hour sessions, weekly or biweekly + crisis management and safety planning; C: Routine care (n = 24); Dose: Varied outpatient treatment; Assessments: Pre- and post-treatment, F/u 6 months	RCT	F/u T: 8%, C: 25% *Treatment completion* (all four sessions): T and C: 100%	Reduced SITBs in T compared to C from pre- to post-treatment; reductions maintained at F/u
FBT-Problem-Focused										
Harrington et al. (1998)	162	10-16 year-olds; 90% female; ethnicity NR	Home (T); Outpatient (C)	In: DSP; Ex: DSH (other than DSP), inability to engage in family intervention, psychiatrist decided participation was contraindicated (e.g., psychosis)	MDD (67%), CD (10%)	SI (SIQ)	T: Family-based problem solving (n = 85), Dose: Five home sessions + TAU; C: TAU (n = 77), Dose: Varied outpatient treatment; Assessments: Pre-treatment, 2 and 6 months	RCT	Total sample F/u 2 months: 4%, F/u 6 months: 8% *Treatment completion:* 74% of T intervention sessions attended	Reduced SI in T compared to C in subset of adolescents without MDD
Interpersonal Psychotherapy (IPT):										
IPT-Individual										
Tang, Jou, Ko, Huang, & Yen (2009)[5]	73	12-18 year-olds; 66% female; ethnicity NR (study conducted in Taiwan)	School	In: Moderate to severe depression, SI, or previous SA, moderate to severe anxiety, or significant hopelessness in the past 2 weeks; Ex: Psychosis, drug abuse, serious	MDD (100%)	SI (BSS)	T: Intensive Interpersonal Psychotherapy for depressed adolescents with suicide risk (IPT-A-IN) (n = 35), Dose: Two sessions weekly + 30 min. phone follow-up for 6 weeks; C: Psychoeducation + supportive counseling (parent included if needed) (n = 38), Dose: One to	RCT	T: 0%, C: 8% *Treatment completion* (full 6-week program): T: 100%; C: 92%	Reduced SI in T compared to C

Authors	Sample Size	Sample Characteristics	Setting	Inclusion (In) and Exclusion (Ex) Criteria	Major Diagnoses	Outcomes/ Measures	Treatment Conditions, Dose, and Assessments	Study Type	Study Attrition Rate (and Treatment Completion)	Main Results
				medication condition, or severe (e.g., high-lethality) suicidal behaviors medication condition, or severe (e.g., high-lethality) suicidal behaviors medication condition, or severe (e.g., high-lethality) suicidal behaviors medication condition, or severe (e.g., high-lethality) suicidal behaviors			two sessions weekly for 6 weeks; Assessments: Pre- and post-treatment			
Psychodynamic Therapy:										
Psychodynamic therapy-Individual + Family										
Rossouw, & Fonagy (2012)	80	12-17 years old; 85% female; 75% Caucasian, 10% Asian, 7.5% mixed race, 5% African American	Outpatient	In: 1 DSH episode past month; Ex: AN or BN, PDD, psychosis, severe learning disability (IQ < 65), chemical dependence	Depressive symptoms (97%), BPD (73%)	DSH (CI-BPD and R-TSHI)	T: Mentalization-Based Treatment (MBT-A) for self-harm (n = 40). Dose: Weekly individual + monthly family therapy for 1 year; C: Community-based TAU-varied (n = 40). Dose: 1 year; Assessments: Pre-treatment, 3, 6, and 9 months after randomization, and post-treatment	RCT	3 months T: 13%, C: 8%; 6 months T: 3%, C: 10%; 9 months T: 13%, C: 15%; 12 months T: 10%, C: 13% *Treatment completion:* T: 50%, C: 43%	Reduced DSH in T compared to C post-treatment (12-month) assessment only
Combined Skills Group Intervention:										
CBT skills + DBT skills + Psychodynamic therapy skills-Group										
Green et al. (2011)	366	12-17 year-olds; 89% female; 94% Caucasian	Outpatient	In: 2 DSH episodes past year; Ex: AN, acute psychosis, substantial learning difficulties	Depressive disorder symptoms (62%), behavioral problems (33%)	DSH (interview validated in Harrington et al., 1998), SI (SIQ)	T: Developmental group psychotherapy (n = 183). Dose: (see Wood et al.) + routine care; C: Routine care only (n = 183). Dose: Varied, but no group therapy; Assessments: Pre-treatment, F/u 6 months and 1 year	RCT	F/u T: 2%, C 2% *Treatment completion (4 sessions):* T: 79%, C: 63%	DSH and SI improvement for both groups, NS differences between groups
Hazell et al. (2009)	72	12-16 year-olds; 90% female; ethnicity NR	Outpatient	In: 2 DSH episodes past year, 1 DSH episode past 3 months; Ex: More intensive treatment required, inability to attend groups, acute psychosis, or intellectual disability	MDD (57%), DBD (7%), alcohol problems (4%)	DSH (PHI), SI (SIQ)	T: Developmental group psychotherapy (n = 35). Dose: (see Wood et al.) for up to 1 year; C: Routine care (n = 37). Dose: Varied for 1 year; Assessments: Pre-treatment, 8 weeks, 6 months, and 1 year	RCT	T: 3%, C: 8% *Treatment completion (4 sessions):* T: 71%, C: 62%	Increased DSH in T compared to C at 6 months and 1 year (however, group differences were nonsignificant after controlling for history of medication overdose); NS for SI
Wood, Trainor, Rothwell, Moore,	63	12-16 year-olds; 78% female; ethnicity NR	Outpatient	In: 1 DSH episode past year;	MDD (84%), DBD (69%)	DSH (interview —see Kerfoot, 1984), SI (SIQ)	T: Developmental group psychotherapy (DGT) + Routine care (n = 32). Dose: Six acute	RCT	F/u 7 months: T: 3%, C: 0%	Fewer DSH repeaters (i.e., multiple DSH

Authors	Sample Size	Sample Characteristics	Setting	Inclusion (In) and Exclusion (Ex) Criteria	Major Diagnoses	Outcomes/ Measures	Treatment Conditions, Dose, and Assessments	Study Type	Study Attrition Rate (and Treatment Completion)	Main Results
							sessions + weekly long-term group as needed for 6 months (*Mdn* = 8 sessions, *Range* 0-19) + Routine care as needed; C: Routine care (*n* = 31), Dose: Family sessions + non-specific counseling as needed (*Mdn* = 4 sessions, *Range* 0-30); Assessments: Pre-treatment, 6 weeks, and 7 months		*Treatment completion* (4 sessions): T: 72%, C: 61%	episodes) in T compared to C and longer time to repeat DSH in T compared to C; NS for SI
Other intervention techniques:										
Resource interventions-Individual										
Cotgrove, Zirinsky, Black, & Weston (1995)	105	12-16 year-olds; 85% female; ethnicity NR	ED	In: Admitted for DSH, DSP, or SA; Ex: NR	NR	SA (unspecified psychiatrist questionnaire)	T: Green card for re-admission to the hospital (*n* = 47); C: Clinic or child psychiatry department TAU (*n* = 58); Assessments: Pre-treatment and F/u 1 year	RCT	Total sample: 0% *Treatment completion*: T: 11% used green card	NS between group differences in SA
Deykin, Hsieh, Joshi, & McNamarra (1986)[6]	319	13-17 year-olds; female: 68% (Boston), 55% (Brockton); Caucasian: 28% (Boston), 68% (Brockton), African American: 57% (Boston), 4% (Brockton)	Community	In: ED presentation with DSH, SA, or SI; Ex: NR	NR	DSH, SI, SA (physicians' reports and medical chart review)	T: Direct service (advocacy, financial needs, social support) + educational training for providers (*n* = 172), Dose: NR; C: Hospital TAU (*n* = 147), Dose: NR; Assessments, Continuous F/u 2 years	Non-randomized controlled trial	N/A (incidence of ED visits examined; specific adolescents were not followed over time)	NS for all SITBs outcomes
Robinson et al. (2012)	164	15-24 year-olds, 65% female; ethnicity NR	Community	In: History DSH or SRB; Ex: Known organic cause for DSH/SRB, intellectual disability	ANX (63%), MD (67%)	DSH (SBQ-14), SI (BSS)	T: Post cards promoting well-being and evidence-based skills use + Community-based TAU (*n* = 81), Dose: Monthly for 12 months; C: Community-based TAU only (*n* = 83), Dose: 12 months; Assessments: Pre-treatment, F/u 12 and 18 months	RCT	F/u: 12 months: T: 26% C: 37%; 18 months: T: 38%, C: 55%	Reduced DSH and SI in both groups, but NS between groups
Support-based interventions										
King et al. (2006)	289	12-17 year-olds; 68% female; 82% Caucasian	Community	In: Recent psychiatric hospitalization, SI or SA past month, and score of 20 or 30 on CAFAS self-harm subscale;	NR	SA (SSBS), SI (SIQ-Jr and SSBS)	T: Youth-nominated Support Team-1 + TAU-varied (*n* = 151), Dose: Psychoeducation for supports + weekly contact between supports and adolescents + supports contacted by	RCT	T: 24%, C: 13% *Treatment completion*: T: 76%, C: 87%	Reduced SI in T compared to C in females only; NS for SA

Authors	Sample Size	Sample Characteristics	Setting	Inclusion (In) and Exclusion (Ex) Criteria	Major Diagnoses	Outcomes/ Measures	Treatment Conditions, Dose, and Assessments	Study Type	Study Attrition Rate (and Treatment Completion)	Main Results
				Ex: Psychosis, severe mental disability Ex: Psychosis, severe mental disability			intervention specialists for 6 months; C: TAU-varied (n = 138), Dose: 6 months; Assessments: Pre- and post-treatment			
King et al. (2009)	448	13-17 year- olds; 71% female; 84% Caucasian	Community	In: Recent psychiatric hospitalization, SI or SA past month; Ex: Severe cognitive impairment, psychosis, medical instability, residential placement, no legal guardian available	UMD (88%); DBD (42%); ANX (29%); PTSD or acute stress disorder (25%); AUD or SUD (21%)	SA (DISC-IV), SI (SIQ-Jr)	T: Youth-nominated Support Team-II + TAU-varied (n = 223), Dose: Psychoeducation for supports + weekly contact between supports and adolescents for 3 months; C: TAU-varied (n = 225); Dose: 3 months; Assessments: Pre-treatment, 6 weeks, 3, 6, and 12 months	RCT	F/u: 6 weeks: 25%, 3 months: 24%, 6 months: 30%, 12 months: 23% *Treatment completion* (full intervention-two support people for 12 weeks): T: 74%	Reduced SI in T compared to C in multiple attempters only and at 6-week f/u only; NS for SA

ED = emergency department; NR = not reported; NS = non-significant; RCT = randomized controlled trial

Major Diagnoses: ADHD = attention deficit disorder; AN = anorexia nervosa; ANX = anxiety disorder–type not specified; ASD = autism spectrum disorder; AUD = alcohol use disorder; BN = bulimia nervosa; BP = bipolar disorder; BPD = borderline personality disorder; CD = conduct disorder; CUD = cannabis use disorder; DBD = disruptive behavior disorder; EMD = emotional disorder; MD = mood disorder (bipolar or unipolar); MDD = major depressive disorder; PD = personality disorder; PDD = pervasive developmental disorder; PTSD = post-traumatic stress disorder; SUD = substance use disorder; SZ = schizophrenia; UMD = unipolar mood disorder

Measures: ASQ-R = Adolescent Suicide Questionnaire Revised; BSI = Brief Symptom Inventory; BSS = Beck Scale for Suicide Ideation; CAFAS = Child and Adolescent Functional Assessment Scale; CBCL = Children Behavior Checklist; CI-BPD= Child Interview for DSM-IV Personality Disorder; DISC-IV = Diagnostic Interview Schedule for Children Version IV; HASS = Harkavy-Asnis Suicide Scale; K-SADS-PL = Schedule for Affective Disorders and Schizophrenia for School-Age Children, Present and Lifetime Version; LPC = Lifetime Parasuicide Count; MFQ = Mood and Feeling Questionnaire; MSSI = Modified Scale for Suicide Ideation; PHI = Parasuicide History Interview; RTSHI = Risk Taking and Self Harm Inventory; SBQ-14 = Suicide Behavior Questionnaire; SHI = Self Harm Inventory; SIQ (Jr or Sn) = Suicide Ideation Questionnaire (for junior high and senior high school students); SSBS = Spectrum of Suicide Behavior Scale; SSI = Scale for Suicide Ideation; SSRS = Suicide Severity Rating Scale; YRBS = Youth Risk Behavior Survey

Outcomes: DSH = deliberate self-harm; DSP = deliberate self-poisoning; NSSI = nonsuicidal self-injury; SA = suicide attempt; SE = suicide event (defined by Columbia Classification Algorithm of Suicide Assessment as one or more of the following: completed suicide, attempted suicide, preparatory acts towards imminent suicidal behavior, suicidal behavior, or suicidal ideation); SI = suicide ideation; SITB = self-injurious thought or behavior (suicidal and nonsuicidal); SP = suicide planning or preparation; SRB = suicide-related behavior (suicide thoughts, plans, attempts)

Treatment Conditions: C = control or comparison group; CBT = Cognitive-Behavioral Therapy; DBT = Dialectic Behavior Therapy; F/u = follow-up; T = experimental treatment group; TAU = treatment as usual

[1]
The CBT-Individual interventions included optional family components (see each study for the specific dose of optional family therapy offered). However, the authors report these components were infrequently utilized during treatment.

[2]
Motivational interviewing (MI) or motivational enhancement techniques incorporated in treatment package.

[3]
Although motivational enhancement techniques were not explicitly discussed in these DBT studies, increasing motivation to change is a core component of the DBT package.

[4]
DBT group skills delivered in a multifamily group format.

[5]
IPT-A-IN was primarily an individual-based intervention. However, one parent of a participant in the IPT group received three family therapy sessions. In addition, parents were included in the TAU supportive counseling sessions if needed.

[6]
Deykin et al. (1986) assessed incidence of ED visits over two years at the two sites where the intervention (Boston) and control (Brockton) treatments were employed; that is, specific participants were not followed over time.

Table 3

Evidence-Base Update for Psychosocial Treatments for Self-Injurious Thoughts and Behaviors in Youth: Summary[1]

Level 1: Well-Established	Level 2: Probably Efficacious	Level 3: Possibly Efficacious	Level 4: Experimental	Level 5: Questionable Efficacy
____	CBT-Individual + CBT-Family + Parent Training (SA)	FBT-Ecological (SA)	CBT-Individual (DSH, SI)	CBT skills + DBT skills + Psychodynamic therapy skills-Group (DSH)
	FBT-Attachment (SI)		CBT-Individual + CBT-Family (SE, SI)	
	FBT-Parent training only (SITB)		CBT skills-Group (SI)	
	IPT-Individual (SI)		DBT (DSH, NSSI, SI)	
	Psychodynamic therapy-Individual + Family (DSH)		DBT-Group only (SI)	
			FBT-Emergency (DSH, SA, SI)	
			FBT-Problem-focused (SI)	
			Resource interventions-Individual (DSH, SA, SI)	
			Support-based interventions (SI)	

Interventions: CBT = cognitive-behavioral therapy; DBT = dialectical behavior therapy; FBT = family-based therapy; IPT = interpersonal psychotherapy

Self-Injurious Outcomes: DSH = deliberate self-harm; NSSI = nonsuicidal self-injury; SA = suicide attempt; SE = suicide event (defined by Columbia Classification Algorithm of Suicide Assessment as one or more of the following: completed suicide, attempted suicide, preparatory acts towards imminent suicidal behavior, suicidal behavior, or suicidal ideation); SI = suicide ideation; SITB = self-injurious thought or behavior (suicidal and nonsuicidal)

[1]For each treatment family, the self-injurious outcome variable(s) examined in treatment studies is listed in parentheses.