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Protecting Adolescents From Self-Harm: A Critical Review of Intervention Studies

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Abstract

Objective—To review the studies that test treatments targeting adolescent suicidal ideation, suicide attempts, or self-harm, and to make recommendations for future intervention development.

Method—The extant randomized clinical trials that aim to reduce the intensity of suicidal ideation or the recurrence of suicide attempts or self-harm were reviewed with respect to treatment components, comparison treatments, sample composition, and outcomes.

Results—The majority of studies that showed any effect on suicidal ideation, attempts, or self-harm had some focus on family interactions or non-familial sources of support. Two of the most efficacious interventions also provided the greatest number of sessions. Some other treatment elements associated with positive effects include addressing motivation for treatment and having explicit plans for integrating the experimental treatment with treatment as usual. In many studies, suicidal events tend to occur very early in the course of treatment prior to when an effective “dose” of treatment could be delivered. Important factors that might mitigate suicidal risk such as sobriety, healthy sleep, and promotion of positive affect were not addressed in most studies.

Conclusion—Interventions that can front-load treatment shortly after the suicidal crisis, e.g., while adolescent suicide attempters are hospitalized, may avert early suicidal events. Treatments that focus on the augmentation of protective factors, such as parent support and positive affect, as

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well as the promotion of sobriety and healthy sleep, may be beneficial with regard to the prevention of recurrent suicidal ideation, attempts, or self-harm in adolescents.

Keywords

adolescent; prevention; psychotherapy; suicide; suicide attempt

Introduction

Suicide is the third leading cause of death in youth aged 15–24 in the United States.¹ Suicidal behavior has its peak incidence in adolescence, with lifetime rates of suicidal ideation with a plan and of actual suicide attempts of about 4% each, with other studies reporting higher rates of suicide attempts in adolescent females (10%).^{1,2}

Suicidal behavior is often recurrent, with 15–30% of adolescent attempters re-attempting within a year, and both case-control and prospective studies show that the risk for completed suicide is markedly elevated in youth who attempt suicide.^{1,3} Self-harm, even nonsuicidal self-harm, has emerged as a strong predictor of both attempted and completed suicide, justifying the inclusion of studies focusing on self-harm in this review.^{4,5} Despite over 2 decades of research and several large clinical trials, there are still no empirically validated treatments that prevent the repetition of adolescent suicidal behavior. Also, observational data suggest that the receipt of mental health services does not protect against subsequent suicidal episodes.² While causal inferences cannot be drawn from observational data, this finding is consistent with a need to develop effective interventions to reduce suicidal risk in youth. In this synthetic overview, we conduct a selective review clinical trials targeting self-harm, suicidal ideation, or suicide attempts, discuss putative “active ingredients” associated with success and possible reasons why many of these studies have not been effective in the reduction of recurrent suicidal behavior. Finally, we offer some recommendations for the future development of interventions to reduce the risk for suicidal behavior among high-risk youth.

Intervention Studies

There have been several sizeable randomized clinical trials focused on the prevention of adolescent “deliberate self-harm,” a category that includes both suicide attempts and nonsuicidal self-injury (NSSI; see Table 1 for definitions⁶). We first review those interventions directed towards family and social networks (Table 2), and then review studies focused on individual skills like cognitive restructuring, problem-solving, and emotion regulation (Table 3).

Intervention studies augmenting family or nonfamilial support

Harrington *et al.*⁷ randomized 162 adolescent suicide attempters (all of whom made overdoses) to treatment as usual (TAU) or TAU plus a brief, home-based family treatment (HBFT) that targeted communication and problem-solving. HBFT, compared to TAU, did not reduce either repetition of overdoses or self-reported suicidal ideation, except for a reduction of suicidal ideation in the nondepressed participants. Although the parents who received HBFT reported greater satisfaction compared to those who received TAU, there was no differential treatment impact on family climate.⁸

King *et al.*^{9,10} developed an intervention, the Youth-nominated Support Team (YST), for adolescents hospitalized for suicidal ideation or behavior to mobilize support from adults in the adolescents’ social network. YST helped adolescents to identify supportive adults and educate those adults who agreed to participate on how to respond to these vulnerable

adolescents' requests for support. The first version, YST-1, was a 6-month intervention; 289 youth who were psychiatrically hospitalized for either suicidal ideation or an attempt were randomized to either YST-1 plus TAU or TAU alone.⁹ Only 35% of eligible adolescents participated in the study, which may limit generalizability. The authors posited that recruitment was challenging when the patient and family were in the midst of a suicidal crisis. The actual intervention was 1–2 hours with the adolescent, and in YST-1, the teen had an average of 39 contacts with members of their social network over the 6 month duration of the intervention phase of the trial. There were no main effects on suicidal ideation or attempts, but post-hoc, girls (but not boys) who received YST-1 showed greater reductions in suicidal ideation than did those assigned to TAU alone.⁹

In the second YST study, 448 youths who were hospitalized for suicidal ideation or an attempt were randomized to either YST-2 + TAU or TAU alone.¹⁰ The proportion of eligible adolescents who participated was also low (43%). YST-2 was a briefer intervention than YST-1 (3 vs. 6 months) and resulted in fewer contacts with social network members (9.5 on average). YST-2 did not exert any main effects with respect to suicide attempts or ideation, but in those participants (38% of the sample) with a history of multiple attempts, YST-2 resulted in a more rapid decline in suicidal ideation at the 6-month follow-up point, but not beyond that. The amount of TAU that both groups received in YST-2 was quite intensive, with 34 psychotherapy or medication sessions in YST-2 and 31 in TAU alone.

Huey *et al.*¹¹ tested the efficacy of multisystemic therapy (MST) in reducing suicide attempts in patients presenting in the emergency department with psychiatric emergencies that included suicide attempts or ideation, but also, homicidal ideation or behavior and psychosis. One hundred fifty-six adolescents were randomized to either MST or hospitalization; however, 44% of those in MST also were hospitalized during the course of the study. Of those randomized to MST, 31% entered the study with a history of a suicide attempt by youth self-report vs. 19% of the TAU group, but at the end of treatment, the rates of reattempt were similar (4%). This finding was reported as statistically significant, but it could be accounted for by regression to the mean. These findings are also difficult to interpret given the high rate of hospitalization in the MST group.

Diamond *et al.*¹² randomized 66 mostly low socioeconomic class, African American adolescents with clinically significant suicidal ideation (defined by a score on the Suicide Ideation Questionnaire–Jr. ≥ 31) to either brief clinical management (BCM) or attachment-based family therapy (ABFT). ABFT aims to repair rifts between parent and child and improve the quality of parent–child relationships. Those in BCM received on average 3 sessions, compared to around 10 sessions in the ABFT arm. ABFT, compared to BCM was associated with a 4–6 fold greater reduction in the rates of clinically significant suicidal ideation. ABFT had similarly advantageous effects on clinically significant depression (defined as a Beck Depression Inventory–II score ≥ 20). In a subsample of participants for whom sessions were videotaped, conjoint sessions were conducted, and outcome data were available, the reduction in suicidal ideation and depression appeared to be mediated by improvements in parent–child relationships.¹³ While these findings are promising, ABFT has not yet been demonstrated to reduce the risk for recurrent suicidal behavior, and currently is being evaluated in a larger trial against a comparator treatment of similar duration and intensity as ABFT.

Esposito-Smythers *et al.*¹⁴ conducted an RCT comparing “integrated cognitive behavior therapy” (iCBT) + TAU to TAU alone in 36 suicidal, alcohol or substance abusing adolescent inpatients. iCBT, in addition to the components of “standard” CBT, also had a motivational interviewing (MI) component to deal with alcohol/substance use, and a strong family component that targeted parent-child communication, parental monitoring,

contingency management, and problem-solving. The iCBT intervention was quite intense, averaging 34.5 sessions, compared to around 20 sessions in TAU condition, the latter of which included CBT that did not address family or substance abuse issues. iCBT was superior to TAU in an 18 month follow-up with regard to the proportion who made suicide attempts (5.3% vs. 35.3%, $p=.023$), were re-hospitalized (15.8% vs. 52.9%, $p=.018$), arrested (5.3% vs. 41.2%, $p=.01$), and who met criteria for alcohol or substance abuse (26.7% vs. 76.5%, $p=.005$).

Rossouw *et al.*¹⁵ compared mentalization based therapy (MBT) to TAU. MBT is a year-long, manualized treatment with weekly individual and monthly family sessions. The focus of MBT is on increasing the adolescent and family's capacity to understand action in terms of thoughts and feelings, which in turn is hypothesized to augment self-control and affect regulation. In this trial, 80 adolescents who had engaged in self-harm (regardless of suicidal intent) were randomized to MBT or TAU; the majority met criteria for depression (97%) and borderline personality disorder (73%). The number of treatment hours was similar in MBT vs. TAU (20.3 vs. 17.3). The odds of self-harm was lower in the MBT vs. TAU group both by self-report (56% vs. 83%, $p=.01$) and by interviewer rating (43% vs. 68%, $p=.05$). MBT was also superior to TAU in the reduction of depressive and borderline symptoms. The impact of MBT on self-harm was mediated by a decrease in avoidant attachment, and an increased self-reported ability to mentalize.

Tang *et al.*¹⁶ randomized 73 adolescents in a school-based intervention who were at risk for self-harm by virtue of one of the following: suicidal ideation, hopelessness, depression, or anxiety to either receive 12 sessions of interpersonal therapy for adolescents, delivered over 6 weeks modified for self-harm and suicidal ideation (IPT-A-IN) or supportive counseling, 30–60 minutes, once or twice per week. Unlike interpersonal therapy for adolescents (IPT-A), IPT-A-IN did not regular have any dyadic sessions with parents, but instead focused on peer- and teacher- related interpersonal stressors that could lead to suicidal ideation, behavior or self-harm, and conducting dyadic sessions with peers and teachers as needed, and also utilized some unspecified cognitive behavior techniques. Potential participants with imminent suicidal risk were excluded. Although diagnostic information was not provided, at intake, all participants were in the clinical range for all of the above-noted outcomes. Ideation, as well as depression, hopelessness, and anxiety were all substantially reduced in the IPT-A-IN group, but not in those who received supportive treatment. However, no information about prior or subsequent NSSI or suicide attempts was provided, nor was longer-term follow-up reported. Thus, IPT-A-IN appears to be feasible and effective at reducing ideation, anxiety, depression, and hopelessness relative to supportive counseling, but its impact on these variables over the longer term, or its impact on NSSI or suicide attempts is unknown.

Ougrin *et al.*,¹⁷ evaluated the impact of Therapeutic Assessment (TA), a 30-minute intervention offered immediately after a standard psychosocial assessment. TA identifies a target problem from the framework of cognitive analytic therapy, uses motivation techniques to enhance motivation to change, identifies potential solutions or “exits,” and summarizes agreed- upon strategies in an “understanding letter” shared with the youth and family. Seventy adolescents presenting with self-harm (47% of whom had taken overdoses) were randomized to either TAU or TA followed by TAU. At the 3 month follow-up, the TA group attended more treatment sessions than those in TAU alone, but there were no differences either in the recurrence or frequency of self-harm episodes.¹⁸ Stratification of results by whether the participants showed suicidal vs. nonsuicidal intent did not show a difference as far as frequency of self-harm at 3 month follow-up, although the NSSI group showed a greater improvement on symptomatology as measured by the Strengths and Difficulties Questionnaire.¹⁹ Upon 2-year follow-up, there was still a difference in total

number of sessions attended (10.9 vs. 7.4), and a nonsignificant trend toward a lower frequency of self-harm in the TA group (OR= 0.69, $p=.3$).¹⁷ A larger sample size might be necessary to more definitively test the impact of TA.

Asarnow *et al.*,²⁰ tested the effect of a 1-session family-based cognitive therapy intervention, the Family Intervention for Suicide Prevention (FISP) delivered in the emergency department (ED) to suicidal or suicide attempting adolescents, designed to increase motivation for follow-up, restrict access to dangerous methods, increase family support, and develop a practical safety plan that the youth and family commit to using. This ED-based intervention was followed by phone calls to encourage follow-up with treatment. When compared to TAU alone, FISP resulted in attendance to more treatment sessions (5.3 vs. 3.1, $p=.003$), but had similar rates of repeat suicide attempt (6%) and recurrent ideation (13%). Thus, FISP was successful in improving adherence to aftercare, but this did not translate to differences in suicidal outcomes.

Pineda and Dadds²¹ randomized 48 adolescents with either self-harm, suicidal ideation or suicide attempt to either the Resourceful Adolescent Parent Program (RAP-P) + TAU vs. TAU alone. The majority of adolescents engaged in more than one type of self-injurious behavior (e.g., self-cutting, 73%, overdose, 65%, hanging, 22%). RAP-P is a strengths-based program for parents, delivered in four 2-hour sessions. These sessions were: (1) psychoeducation about adolescent suicide and self-injurious behavior, strategies to prevent recurrences, and how to access services; (2) identification of existing parent strengths, and management of stress in order to be able to be a more effective parent; (3) normal adolescent development, promoting teen self-esteem, and balancing the adolescent's drive for independence with attachment issues; and (4) strategies to promote family cohesion and manage conflict; The primary outcome was a score on the Adolescent Suicide Questionnaire-Revised (ASQ-R), which assesses ideation, self-harm, and suicidal behavior.²² The RAP-P group showed greater declines on the ASQ-R, as well as greater improvements in symptoms and functioning. Improvements in parent-reported family functioning mediated the improvement in suicidal outcome.

Intervention studies focusing on individual skills and behavior

Three studies evaluated Developmental Group Treatment (DGT), which consists of around 8 group sessions focused on problem-solving, emotion regulation, and social skills training applied to the following problem arenas: school, peers, family, anger, depression, and self-harm.²³⁻²⁵ The initial pilot study was promising, showing that DGT, when added to TAU, resulted in fewer repetitions of self-harm at 6-month follow-up, and that the risk of engaging in at least 2 episodes of self-harm was over 6 times lower in the DGT group.²³ Limitations of this pilot study were that the outcomes were not separated by NSSI versus suicide attempt, and the experimental treatment had greater therapeutic contact, with 8 DGT sessions and an average of 2.5 TAU sessions, vs. 1 session of TAU in the comparison group.

Two multisite studies of DGT failed to replicate these promising results. The first was a three-site study conducted in Australia²⁴ that randomized 72 adolescents to DGT + TAU vs. TAU alone. Around half of the sample was depressed, and at least half had engaged in suicide attempts (e.g., by overdose or hanging). The DGT group received nearly 9 sessions on average, and both groups received 10 sessions of TAU. At 6 months, DGT was associated with a higher rate of recurrent self-harm (88% vs. 68%, $p=.04$), which became a nonsignificant trend at 12 months (88% vs. 71%, $p=.07$). The DGT group, through the randomization procedure, had a much higher rate of previous suicide attempts (71% vs. 43%), and after controlling for this difference, the rate of recurrent self-harm was not different at either time point. At 12 months, the rate of repeated suicide attempts was 37% in

DGT + TAU vs. 45% in TAU alone. DGT was associated with a greater improvement in global symptoms.

The second replication, conducted in the UK, was an 8-site clinical trial of DGT plus TAU vs. TAU alone in 366 adolescents who had engaged in either nonsuicidal self-harm or a suicidal attempt.²⁵ Nearly 2/3 had engaged in suicidal behavior. Those in the experimental treatment received 10 sessions of DGT and nearly 9 sessions of TAU, compared to around 10 sessions of TAU in the comparison arm. DGT + TAU, was no more efficacious than TAU alone, with an odds ratio (OR) of repetition of self-harm of .99 and .88 at 6 and 12 months, respectively, with similar findings for suicide attempts. Explanations for these findings offered by the investigators in both replication studies included improvement in the quality and quantity of TAU compared to the initial pilot study, too few sessions of DGT to result in sustained behavior change, and a lack of individualization of treatment to the individual needs of the self-harming youth.^{24,25}

Donaldson *et al.*²⁶ tested the efficacy of a skills-based therapy (SBT) vs. supportive relationship therapy (SRT). SBT emphasized problem-solving and affect regulation, two domains strongly linked to adolescent suicidal behavior.^{1,26} In this sample of 39 adolescent suicide attempters, nearly half had a disruptive behavior disorder, around 1/3 were depressed, and nearly half had problems with cannabis. Both groups received around 10 sessions, and at the end of the intervention, there was no significant difference between SBT and SRT with respect to recurrent suicidal behavior (26.7% vs. 12.5%).

Chanen *et al.*²⁷ compared cognitive analytic therapy (CAT) vs. “good clinical care (GCC)” for 78 adolescents with 2–9 borderline personality traits, along with at least one additional risk factor for developing borderline personality disorder (low socioeconomic status, disruptive behavior disorder, depressive symptoms, or history of abuse). Participants received 13 sessions on average of CAT vs. 11 of GCC. The outcome was self-harm, which was not broken down further into categories of NSSI and suicide attempt. Over 1/3 (36%) of those randomized to CAT had self-harm behavior occurring at least weekly at intake vs. 12% at 24 months (odds ratio [OR]=.32), whereas in GCC, 56% of those at intake were engaging in at least weekly self-harm vs. none at 24 months (OR=.08). Overall, the rate of change in self-harm was not different between the two treatments (relative risk [RR] =.91), nor was the rate at 24 months different in CAT vs. GCC (RR=1.19).

Intervention studies primarily focused on depression

The leading psychiatric risk factor for adolescent suicide is depression¹, and therefore we review the extent to which interventions for depression reduce suicidal ideation, attempt, or self-harm. Meta-analyses of large clinical trials of primary adolescent depression do not show that the combination of CBT and antidepressant provides protection against suicidal events (defined as a suicide attempt or clinically significant increase in suicidal ideation) compared to antidepressant alone.²⁸ However, a meta-analysis that also included youth with depression and comorbid substance abuse did find a protective effect of CBT (including CBT focused on substance abuse).²⁹ In a recent meta-analysis of all registered fluoxetine and venlafaxine clinical trials for depression, adults showed a strong correlation between reduction in depression and in suicidal ideation. However, for youth aged 24 and younger, while the effects of medication on depression were similar to those found in their older counterparts, there was no medication effect on suicidal ideation.³⁰ This finding is consistent with studies of suicide across the lifespan that show that depression, while a highly significant contributor to suicide risk in youth, is less central to suicidal risk in adolescents and young adults than it is in mid-life and older adults.¹

Research Synthesis

Design

It is difficult to compare studies due to inconsistent definitions and reporting of outcomes (e.g., self harm, NSSI, suicide attempts), lack of sufficient power in all but a few studies, incomplete characterization of “treatment as usual,” and few tests of mediation to identify active ingredients.

Possible ingredients for success

A brief intervention is sufficient to improve adherence to aftercare in suicidal youth, but this in turn does not affect outcome.^{18,20} Most individually-focused interventions have not been successful in reducing suicidal risk, although these conclusions could be qualified due to the relatively low number of sessions in many of the individual treatments, and the relative strength, at least in terms of the number of sessions of TAU. Two significant factors that may have contributed to the success of some studies were a sufficient dose of treatment, and family involvement or mobilization of non-familial support. The studies with the strongest effect on self-harm and suicide attempts (namely MBT and iCBT) each had family components and provided a large number of individual sessions.^{14,15} Other studies with some success in reducing suicidal ideation focused on augmenting familial or nonfamilial sources of support.^{9,10,12,16,21}

Less successful intervention studies may not have optimized interventions with regard to timing, sequence, and integration with other treatments, treatment orientation, and targeted domains.

Timing

The highest risk period for recurrent suicidal events (defined as a suicide, a re-attempt or a clinically significant increase in suicidal ideation requiring an emergency evaluation) in clinical trials and recently hospitalized suicide attempters is within 1–4 weeks from discharge from psychiatric hospital or emergency department (ED).^{31–37} In clinical trials of adolescent depression and depressed suicide attempters, the median time to a suicidal event was 3 to 5 weeks from the initiation of treatment.^{33–35} During this high risk period, the intensity of treatment may be insufficient time to protect against recurrent suicidal behavior. On the other hand, improved care coordination, access to care, and greater intensity of treatment during this very high risk period appears to reduce the suicide rate in adults, through the arrangement of a follow-up appointment within 7 days, availability of 24 hour crisis intervention, and assertive outreach to nonadherent individuals.³⁸

Sequence and integration of care

Clinical trials of suicidal individuals have often offered an experimental treatment on top of TAU without clear communication between the experimental treatment provider and the clinician providing TAU. In contrast, 2 treatment models that have successfully reduced the rate of recurrent suicidal behavior in adults have, as part of their intervention, explicit means of integrating their model of treatment with co-occurring TAU. In the first study, TAU alone was compared to TAU plus cognitive behavior therapy (CBT) specifically designed to address suicidogenic cognitive distortions; there was also a case manager across treatment cells who encouraged participation in TAU and provided liaisons between the CBT and TAU teams.³⁹ In a second successful treatment, Dialectical Behavior Therapy (DBT), which focuses on augmenting emotion regulation, distress tolerance, and interpersonal effectiveness, the patient is coached by the therapist on how to communicate clinical concerns to TAU clinicians (e.g., request medication changes).⁴⁰ Among adolescent-focused trials, the RAP-P trial provided education to parents on how to access services.²¹

In contrast, the majority of studies in adolescents that have added an experimental treatment to TAU have not explicitly integrated TAU with the experimental treatment.^{7,23–25} Therefore, requiring that such participants and families, who often have difficulty adhering to a single treatment, to adhere to *two* treatments that are not integrated with respect to scheduling or treatment goals could lead to confusion and nonadherence.⁴¹

Treatment orientation and targets

A purely deficit-focused orientation may not be appropriate when the goal of an intervention is to prevent the recurrence of a behavior, specifically, suicidal or self-harm behavior. In contrast, augmentation of protective factors, such as parental support and monitoring can protect against the development of adolescent health risk behaviors, including suicidal behavior,^{42,43} as explicitly demonstrated in the RAP-P trial.²¹ Augmentation of protective factors is not necessarily the mirrorimage of targeting risk factors. For example, interventions that relieve negative mood are different from those that augment positive mood⁴⁴ and interventions to augment a positive relationship between parent and child are different from those that relieve parent–child discord.

We posit that there are five key factors that should be considered for future interventions to prevent recurrent adolescent suicidal behavior: (1) motivation to change; (2) sobriety; (3) family or nonfamilial support; (4) promotion of positive affect; and (5) healthy sleep. Interventions to target these factors are recommended because they are modifiable, are related to suicidal behavior through observational studies, and in some cases, successful adolescent suicidal intervention studies have targeted these domains. However, only empirical studies can test whether the modification of a risk factor translates to a change in suicidal risk.

Motivation to change and commitment to treatment are important elements of care that have been shown to be strong predictors of change across a wide range of health behaviors.⁴⁵ A significant (30–50%) proportion of adolescent suicide attempters are nonadherent with treatment recommendations, hence, use of motivational interviewing (MI) to promote adherence to treatment may be a necessary (although not necessarily a sufficient) element of treatment.^{17,20,41,46}

A high proportion of adolescents who attempt suicide do so either during, or immediately after use of alcohol or drugs.⁴⁷ Alcohol intoxication increases the likelihood of suicide by firearms, the method with the greatest potential lethality.⁴⁸ Alcohol and drug use are predictive of early suicidal events, and nonresponse in depressed adolescents.^{34,35} A single MI session can reduce alcohol and drug use.⁴⁹ In the only RCT that clearly showed a reduction in the rate of adolescent suicide attempts, MI, along with other interventions, reduced alcohol and substance abuse, which paralleled a reduction in recurrent suicidal behavior.¹⁴

Family adaptability and cohesion are protective against subsequent recurrent suicidal behavior,³⁵ and conversely, family conflict is one of the most salient predictors of suicidal events in adolescents.^{5,34,50} The 6 interventions in adolescents that found some positive effects in reducing suicidal risk all had some focus on augmentation of the quality of parent–child or other adult relationships.^{9,10,12,14–16,21} In RAP-P and ABFT, the focus of treatment is on improving the quality of the parent–child relationship, which mediated treatment effects in both intervention studies.^{12,13,21} iCBT¹⁴ addressed family interaction, consistent discipline, and parent–child communication, and found that improvements in these domains paralleled decreases in alcohol and substance use and in re-attempts. YST^{9,10} did result in a reduction in suicidal ideation in clinical subgroups (e.g., females, multiple suicide attempters). MBT's treatment model, while primarily individually-focused, contains a

family component, and treatment effects were mediated in part by decreases in avoidant attachment.¹⁵ IPT-A-IN¹⁶ focused on school-based interpersonal precipitants for self-harm and conducted dyadic sessions with peers and teachers as needed.

The role of negative affect in risk for adolescents suicidal ideation, self-harm, and suicide attempt is well-known, but there is increasing recognition that positive affect can protect against suicidal behavior in depressed adults and adolescents.^{51,52} This distinction between negative and positive affect is important because: (1) positive affect and reward-related neural systems involve a distinct circuitry from those related to the experience of negative emotion; (2) standard treatments for depression may not always be successful in improving positive affect; and (3) improvement in the ability to sustain positive affect may require different interventions from standard treatment.^{44,53,54} Enhancement of positive affect can also speed recovery from distress.⁵⁵ These converging lines of research underscore the potential importance of enhancing positive affect in the prevention of recurrent suicidal behavior, but interventions targeting this domain have yet to be tested in suicidal or self-harming adolescents.

Insomnia is one of the most potent imminent risk factors for adult completed suicide.^{56,57} Insomnia in the previous week predicted a 5-fold increased risk for suicide compared to controls, even after controlling for the severity of mood symptoms.⁵⁷ Difficulty sleeping predicts future self-harm behaviors, mediated in part by a negative impact of poor sleep on depression and suicidal ideation in adolescents.⁵⁸ In experimental studies, sleep deprivation and insomnia in adolescents and adults results in mood lability, lower positive and greater negative affect, and impulsivity in response to negative stimuli, all of which can increase suicidal risk.^{59–62} Finally, insomnia is a negative moderator of treatment response to antidepressants in adolescents, meaning that in patients with insomnia, antidepressants are no more efficacious than placebo.⁶³ While intervention studies have linked improvement in sleep to improvements in mood, social relationships, and academic performance, no study has yet tested whether improvement in sleep quality will reduce suicidal ideation or risk for suicide re-attempt.⁶⁰

Research Recommendations

Sample size, outcomes, treatment intensity

Studies should be sufficiently powered, with clearly different and consistent outcomes, broken down by ideation, attempt, and NSSI, and treatment should be of sufficient intensity and duration.

Timing and site of intervention

Especially in patients referred from inpatient units, suicidal events tend to occur early in outpatient treatment. Therefore, we propose, for psychiatrically hospitalized suicide attempters, that treatment should be initiated when adolescents are hospitalized in an inpatient unit. Even during a brief (e.g., 3–10 day) inpatient stay, there is sufficient time to provide treatment focused on reducing the risk for early suicidal events prior to discharge. If a patient is seen in the ED and not hospitalized, treatment could be initiated in the ED, and additional intervention sessions can be provided in home visits. These interventions, should they prove efficacious, could be delivered by mobile crisis teams that could be deployed to the inpatient unit, ED, or home.

Integration and sequencing of interventions

For patients making the transition from inpatient to outpatient, we recommend that interventions that target suicidal risk be given priority, and followed by a clinical hand-off to

the outpatient clinician who may provide more symptomatic treatment (e.g., depression, anxiety, etc.). In experimental studies in which treatment is offered at the same time as TAU, we recommend that the 2 treatments be explicitly coordinated, following the successful models of 2 adult intervention trials.^{39,40}

Treatment orientation and targets

When appropriate, we recommend a therapeutic orientation towards the augmentation of factors that will protect against the recurrence of suicidal behavior, such as improvement in family support and the ability to experience and sustain positive mood.

We propose that the overarching framework of treatment be that of MI, because enhancing motivation to change is a powerful factor in promoting behavior change across a broad range of health behaviors.⁴⁵ In addition, MI is particularly salient for decreasing substance use, an important treatment objective, given the critical role of drug and alcohol use in suicidal events and treatment non-response.^{14,34,35} The augmentation of parent-child support and effective parental monitoring has been shown to protect against recurrent suicidal events and alcohol and drug abuse.^{13,14,35} The ability to enhance and sustain positive affect through techniques like savoring may also be an effective strategy for the prevention of recurrent suicidal behavior and self-harm.⁴⁴

Finally, sleep difficulties can be addressed through interventions that promote improved sleep hygiene, that reduce and counter rumination, and through behavioral techniques like stimulus control to provide relief for difficulty falling asleep.^{44,64} Prioritizing the improvement of sleep early in treatment intervention may attenuate suicidal risk, given the strong relationship between sleep difficulties and emotional lability, suicidal ideation, suicidal behavior, and suboptimal treatment response.^{56-58,60,63}

Summary

Among extant studies to prevent recurrent adolescent suicidality and self-harm, treatment elements that seem to be related to positive outcomes are the augmentation of familial and other sources of support, provision of a sufficient dose of treatment, and attention to sobriety and motivation. With regard to future studies, we recommend that: (1) intervention studies should be sufficiently powered, should use consistent and accepted definitions of self-harm, and should report results for both suicide attempts and NSSI separately; (2) treatment must be of sufficient intensity and duration; (3) based on the extant literature, successful treatments thus far have targeted sobriety, family processes and support, and internal representations of attachment; (4) some promising domains to be targeted in the future domains include sleep and positive affect.; (5) hospitalized adolescents should get a “front-loading” of treatment, since the risk of recurrence is highest right after discharge; and (6) if an experimental intervention is conducted in addition to TAU, explicit procedures should be developed for coordinating the 2 interventions.

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Table 1

Definitions of Suicidal and Self-Harm Behavior

Suicidal Ideation (SI)	Thoughts about wanting to be dead or about active wanting to commit suicide
Suicide Attempt (SA)	Self-injurious behavior accompanied by explicit or inferred intent to die
Nonsuicidal Self-Injury (NSSI)	Self-injurious behavior without intent to die, often with goal to relieve distress, punish self, escape, or gain attention
Self-Harm (SH)	Self-injurious behavior, by either SA or NSSI
Suicidal Events	Suicide attempts, or emergency referral for increased SI

Note: Adapted from Posner *et al.*, 2007⁶

Table 2
Treatments With Family or Social Network Focus for the Prevention of Suicide Attempts and Suicidal Ideation

Study	Treatment Contrast, Sessions, n	Treatment Focus (Family/Social Network)						Sample						Outcome	Timing Since Intake, Months	Result, OR	
		PS	COM	MCM	SUP	MI	NFS	MBT	N	SA	NSSI	SI	DEP				DBD
Harrington <i>et al.</i> , 1998 ⁷	HBFT (4.5) vs. TAU (3.6)	✓							100%	—	—	67%	11%	—	SI	6	Treatment effect in nondepressed group only*
Huey <i>et al.</i> , 2004 ¹¹	MST + TAU vs. Hospitalization + TAU	✓	✓	✓			✓		43%	—	57%	—	—	SA	6	1.0	
King <i>et al.</i> , 2006 ⁹	YST (6.1) + TAU vs. TAU						✓		66%	—	34%	89%	—	SI	6	Child-rated attempts same in MST vs. TAU, but MST had a higher rate at baseline	
King <i>et al.</i> , 2009 ¹⁰	YST (2) + TAU (34) vs. TAU (31)						✓		75%	—	25%	88%	42%	SI	6	Reduction in multiple attempters only*	
Diamond <i>et al.</i> , 2010 ¹²	ABFT (9.7) vs. TAU (19.9)	✓	✓	✓					62%	—	100%	47%	57%	SA	12	0.71	
Esposito-Smythers <i>et al.</i> , 2011 ^{14, a}	i-CBT+TAU (34) vs. TAU (19.9)	✓	✓			✓			75%	—	25%	94%	50%	SA	18	0.15*	
Roussow <i>et al.</i> , 2011 ¹⁵	MBT (20) vs. TAU (17)							✓	65%	—	—	97%	—	SH	12	0.10*	
Ougrin <i>et al.</i> , 2011, 2013 ^{17,18}	TA (1) + TAU (10.9) vs. TAU (7.4)	✓	✓	✓		✓			47%	53%	?	60% ^b	13%	SH	24	0.69; more symptom improvement in NSSI group; improved	

Study	Treatment Contrast, Sessions, n	Treatment Focus (Family/Social Network)						Sample						Outcome	Timing Since Intake, Months	Result, OR					
		PS	COM	MCM	SUP	MI	NFS	MBT	N	SA	NSSI	SI	DEP				DBD	ALC			
Asarnow <i>et al.</i> , 2011 ²⁰	FISP (1) + TAU (5,3) vs. TAU(3,1)	✓			✓							181	47%	53%	78%		58%	17%	SA SI	9	1.0 1.0 Improved engagement in the FISP group
Pineda and Dadds, 2013 ²¹	RAP-P (4) + TAU (1) vs. TAU (1)	✓	✓	✓	✓							48							ASQ-R	6	d=.72 ^d
Tang <i>et al.</i> , 2009	IPT-A-IN (12) vs. SC (3-12)	✓		✓	✓	73	?	?	?	?	?	?	?	e	e	?	?	?	SI	1.5	d=.82

Note: ABFT= Attachment Based Family Therapy; ALC= Alcohol problem; ASQ-R=Adolescent Suicide Questionnaire-Revised; COM=Communication; DBD=Disruptive Behavior Disorder; DEP=Depression; FISP = Family Intervention for Suicide Prevention; HBFT= Home-Based Family Treatment; i-CBT= Integrated-Cognitive Behavioral Therapy; IPT-A-IN= Interpersonal Therapy for suicidal, self-harming youth; MBT=Mentalization-based Therapy; MCM=Monitoring + Contingency Management; MST= Multisystemic Therapy; NFS= Nonfamilial Support; NSSI= Non-Suicidal Self-Injury; OR=Odds Ratio; RAP-P =Resourceful Adolescent Parent Program; SA=Suicide Attempt; SC=Supportive Counseling; SH= Self Harm; SI=Suicidal Ideation; SUP=Support; TAU=Treatment as usual; YST= Youth-nominated Support Team.

^a Study also included individual-based treatment foci, which included Motivational Interviewing (MI), Cognitive Restructuring (CR), Emotion Regulation (ER), Problem Solving (PS), and Social Skills (SS).

^b Depression or anxiety

^c 37% had additional comorbidities

^d d=effect size

^e Group means indicate that average scores showed clinically significant depression, anxiety, suicidal ideation, and hopelessness.

* p<.05

Table 3
Individual-Focused Treatments for Prevention of Suicide Attempts and Nonsuicidal Self-Injury

Study	Treatment Contrast, Sessions, n	Treatment Focus, Individual			N	Sample					Outcome	Timing Since Intake, Months	Result, OR	
		CR	ER	PS		SS	SA	NSSI	SI	DEP				DBD
Wood <i>et al.</i> , 2001 ²³	DGT (8) + TAU (5) vs. TAU (1)	✓	✓	✓	✓	79%	75%	—	89%	68%	44%	Episodes of self harm (SH), n	6	0.6 vs. 1.8*
Donaldson <i>et al.</i> , 2005 ²⁶	SBT (9.7) vs. SRT (9.5)	✓	✓	✓	✓	100%	—	—	29%	45%	16%	2 repetitions of SH	6	0.16*
Chanen <i>et al.</i> , 2008 ²⁷	CAT (13) vs. GCC (11)	✓	✓	✓	✓	2-9 symptoms of BPD + either low SES, depressive sx, DBD, or history of abuse	—	—	—	—	—	Rate of change of SH	24	0.91
Hazzell <i>et al.</i> , 2009 ²⁴	DGT (8.8) + TAU (10) vs. TAU (10)	✓	✓	✓	✓	57%	98%	—	57%	7%	5%	SH	6	3.5 ^a
		✓	✓	✓	✓	—	—	—	—	—	—	SH	6	3.1
		✓	✓	✓	✓	—	—	—	—	—	—	SA	12	0.72
Green <i>et al.</i> , 2011 ²⁵	DGT (10.2) + TAU (8.5) vs. TAU (9.7)	✓	✓	✓	✓	38%	99%	—	62%	33%	—	Freq of SH	6	0.99
		✓	✓	✓	✓	—	—	—	—	—	—	SA	12	0.88
		✓	✓	✓	✓	—	—	—	—	—	—	SA	6	0.80
														0.97

Note: ALC= Alcohol problem; CAT=Cognitive Analysis Therapy; CR=Cognitive Restructuring; DBD=Disruptive Behavior Disorder; DEP=Depression; DGT=Developmental Group Therapy; BPD=Borderline Personality Disorder; ER= Emotion Regulation; GCC=Good Clinical Care; NSSI= Nonsuicidal Self-Injury; OR=Odds Ratio; PS=Problem Solving; SA=Suicide Attempt; SBT= Skills Based Therapy; SES=Socioeconomic Status; SH= Self Harm; SI=Suicidal Ideation; SRT= Supportive Relationship Therapy; SS=Social Skills; TAU=Treatment as usual.

^a DGT group had significantly higher rate of previous attempts, which was related to SH.

* p<.05