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Management of Suicidal Thoughts and Behaviors in Youth: A Systematic Review

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This report is based on research conducted by the XXXXX Evidence-based Practice Center (EPC) under contract to the Agency for Healthcare Research and Quality (AHRQ), Rockville, MD (Contract No. XXX-20XX-XXXXX). The findings and conclusions in this document are those of the authors, who are responsible for its contents; the findings and conclusions do not necessarily represent the views of AHRQ. Therefore, no statement in this report should be construed as an official position of AHRQ or of the U.S. Department of Health and Human Services.

None of the investigators have any affiliations or financial involvement that conflicts with the material presented in this report.

The information in this report is intended to help healthcare decision makers—patients and clinicians, health system leaders, and policymakers, among others—make well-informed decisions and thereby improve the quality of healthcare services. This report is not intended to be a substitute for the application of clinical judgment. Anyone who makes decisions concerning the provision of clinical care should consider this report in the same way as any medical reference and in conjunction with all other pertinent information, i.e., in the context of available resources and circumstances presented by individual patients.

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Preface

The Agency for Healthcare Research and Quality (AHRQ), through its Evidence-based Practice Centers (EPCs), sponsors the development of systematic reviews to assist public- and private-sector organizations in their efforts to improve the quality of healthcare in the United States. These reviews provide comprehensive, science-based information on common, costly medical conditions, and new healthcare technologies and strategies.

Systematic reviews are the building blocks underlying evidence-based practice; they focus attention on the strength and limits of evidence from research studies about the effectiveness and safety of a clinical intervention. In the context of developing recommendations for practice, systematic reviews can help clarify whether assertions about the value of the intervention are based on strong evidence from clinical studies. For more information about AHRQ EPC systematic reviews, see https://effectivehealthcare.ahrq.gov/about/epc/evidence-synthesis

AHRQ expects that these systematic reviews will be helpful to health plans, providers, purchasers, government programs, and the healthcare system as a whole. Transparency and stakeholder input are essential to the Effective Health Care Program. Please visit the website (www.effectivehealthcare.ahrq.gov) to see draft research questions and reports or to join an e-mail list to learn about new program products and opportunities for input.

If you have comments on this systematic review, they may be sent by mail to the Task Order Officer named below at: Agency for Healthcare Research and Quality, 5600 Fishers Lane, Rockville, MD 20857, or by email to epc@ahrq.hhs.gov.

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Key Informants

In designing the study questions, the EPC consulted several Key Informants who represent the end-users of research. The EPC sought the Key Informant input on the priority areas for research and synthesis. Key Informants are not involved in the analysis of the evidence or the writing of the report. Therefore, in the end, study questions, design, methodological approaches, and/or conclusions do not necessarily represent the views of individual Key Informants.

Key Informants must disclose any financial conflicts of interest greater than $5,000 and any other relevant business or professional conflicts of interest. Because of their role as end-users, individuals with potential conflicts may be retained. The TOO and the EPC work to balance, manage, or mitigate any conflicts of interest.

The list of Key Informants who provided input to this report will be added in the final version of the report.

Technical Expert Panel

In designing the study questions and methodology at the outset of this report, the EPC consulted several technical and content experts. Broad expertise and perspectives were sought. Divergent and conflicting opinions are common and perceived as healthy scientific discourse that results in a thoughtful, relevant systematic review. Therefore, in the end, study questions, design, methodologic approaches, and/or conclusions do not necessarily represent the views of individual technical and content experts.

Technical Experts must disclose any financial conflicts of interest greater than $5,000 and any other relevant business or professional conflicts of interest. Because of their unique clinical or content expertise, individuals with potential conflicts may be retained. The TOO and the EPC work to balance, manage, or mitigate any potential conflicts of interest identified.

The list of Technical Experts who provided input to this report will be added in the final version of the report.

Peer Reviewers

Prior to publication of the final evidence report, EPCs sought input from independent Peer Reviewers without financial conflicts of interest. However, the conclusions and synthesis of the scientific literature presented in this report do not necessarily represent the views of individual reviewers. AHRQ may also seek comments from other Federal agencies when appropriate.

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content expertise, individuals with potential non-financial conflicts may be retained. The TOO and the EPC work to balance, manage, or mitigate any potential non-financial conflicts of interest identified.

The list of Peer Reviewers will be added in the final version of the report.

Management of Suicidal Thoughts and Behaviors in Youth: A Systematic Review

Abstract

Background: Suicide is a leading cause of death in young people and an escalating public health crisis. We aimed to assess the effectiveness and harms of available treatments for suicidal thoughts and behaviors in youths at heightened risk for suicide.

Methods: We conducted a systematic review and searched several databases including MEDLINE®, Embase®, Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, Scopus® and various grey literature sources from January 1, 2000, to November 22, 2023. We included randomized clinical trials (RCTs), comparative observational studies, and before-after studies of psychosocial interventions, pharmacological interventions, neurotherapeutics, emerging therapies, and combinations therapies. Eligible patients were youths (aged 5 to 24 years) who had a heightened risk for suicide, including suicidal ideation, prior attempts, hospital discharge for mental health treatment, or command hallucinations; were identified as high risk on validated questionnaires; were adolescents from racial/ethnic minority groups known to be at increased risk of suicide; were from the lesbian, gay, bisexual, transgender, questioning, or queer (LGBTQ+) community; or were exposed to high levels of crime/violence. Pairs of independent reviewers selected and appraised studies.

Results: We included 61 studies reporting on 14,086 patients (31 RCTs, 12 comparative observational studies, and 18 before-after studies). Psychosocial interventions identified from the studies comprised psychotherapy interventions (Cognitive Behavior Therapy, Dialectical Behavior Therapy, Collaborative Assessment and Management of Suicidality, Attachment-Based Family Therapy, and Family-Focused Therapy), acute (i.e., 1 to 4 sessions/contacts) psychosocial interventions (safety planning, family-based crisis management, motivational interviewing crisis interventions, continuity of care following crisis, and brief adjunctive treatments), and school/community-based psychosocial interventions (social network interventions, school-based skills interventions, suicide awareness/gatekeeper programs, and community-based, culturally tailored adjunct programs). For most categories of psychotherapies, acute interventions, or school/community-based interventions, there was insufficient strength of evidence and uncertainty about reducing suicidal thoughts or attempts. None of the studies evaluated adverse events associated with the interventions. The evidence base on pharmacological treatment for suicidal youths was largely nonexistent at the present time. No eligible study evaluated neurotherapeutics or emerging therapies.

Conclusion: The current evidence on available interventions targeting youths at heightened risk of suicide is uncertain. Medication, neurotherapeutics, and emerging therapies remain unstudied in this population. Given that most treatments were adapted from adult protocols, this limited evidence base calls for the development of novel, developmentally- and trauma-informed treatments, as well as multi-level interventions to target the rising suicide risk in youths.

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Executive Summary

Main Points

- The current body of evidence is derived primarily from racially and ethnically diverse females aged between 12 and 18 years, who had depression, bipolar disorder, or suicidal ideations.
- Low strength of evidence supports that dialectical behavior therapy (DBT) may reduce suicidal ideation (SI) and nonsuicidal self-injury (NSSI) when administered as a multicomponent treatment over 6 months. However, the effectiveness was not durable and did not differ from individual and group supportive therapy at 6 to 12 months followup. Evidence supporting an effect on other outcomes such as suicidal attempts (SA), emergency department (ED) visits and hospital admission is insufficient. Evidence supporting shorter or modified versions of DBT is insufficient.
- Low strength of evidence supports that cognitive behavioral therapy (CBT) may be associated with a trivial or no effect on SI, SA, or self-injury.
- The current evidence is insufficient to support an effect of several psychosocial therapies on SI and SA in children, adolescents, and young adults, including Collaborative Assessment and Management of Suicidality (CAMS), Attachment-Based Family Therapy (ABFT), and Family-Focused Therapy (FFT).
- The current evidence is insufficient to support an effect of acute interventions delivered in the ED or following discharge on SI and SA in children, adolescents, and young adults. This includes safety planning, family-based crisis interventions, motivational interviewing crisis interventions, continuity of care following crisis, and brief adjunctive treatments.
- The current evidence is insufficient to support an effect of school/community-based psychosocial interventions on SI and SA in children, adolescents, and young adults, including social network interventions, school-based skills interventions, suicide awareness/gatekeeper programs, and community-based, culturally tailored adjunct programs.
- The evidence base on pharmacological treatment for suicidal youths is largely nonexistent at the present time. No eligible study evaluated neurotherapeutics therapies.
- The uncertainty about the effectiveness of most interventions compared with group or supportive care suggests that nonspecific therapeutic factors common to all psychotherapeutic approaches and supportive treatments, such as empathy, therapeutic alliance, and contact with the healthcare system, might contribute to outcomes more than the therapeutic strategies themselves.

Background and Purpose

Suicide is a leading cause of death in young people and an escalating public health crisis. Suicidal thoughts and behaviors most commonly emerge during the transition from childhood into early adolescence, with the first SAs typically occurring and peaking in mid-adolescence before decreasing with the transition into young adulthood.[1, 2] In the United States, mortality

rates associated with suicide have steadily increased since 2007. Over a similar time period, the proportion of suicide-related ED visits in youths aged 5 to 24 years in the United States has seen a 5-fold increase, going from 0.9% to 4.2% of all pediatric ED visits.[3, 4] In contrast to what had been previously believed, suicidal thoughts and behaviors in youth are not limited to adolescents and young adults. The lifetime prevalence of suicidal ideation and attempts in children under the age of 12 years are 15.1% and 2.6%, respectively.[6] Seventeen percent of preadolescent children with suicidal ideation go on to try to take their life, and male children have a higher suicide rate than female children.[6] Research suggests specific communities of teens are at even greater risk than the general youth population, including those who identify as male or are part of specific racial/ethnic minority groups, as well as those who are part of the lesbian, gay, bisexual, transgender, questioning, or queer (LGBTQ+) community.[7]

Despite the alarming increase in suicidal thoughts, behaviors, and suicide deaths among young people, there are few evidence-based guidelines to inform the implementation of interventions for children, adolescents, and young adults at high risk for suicidal thoughts and behaviors. In practice, treatments for suicidal thoughts and behaviors typically include psychosocial and pharmacological interventions or their combination, although most of the supporting evidence has been extrapolated from studies on adults.[9, 10] Given the profound need to address the current suicide crisis, other interventions used in adults have been proposed in this context, including electroconvulsive therapy, brain stimulation interventions, and other neurotherapeutics.[10, 11]

This systematic review aims to assess the effectiveness and harms of treatments for suicidal thoughts and behaviors in children, adolescents, and young adults. Data on effect modifiers of the effectiveness and harms will also be synthesized when available. This work will be used by the American Psychological Association to develop a new clinical practice guideline on this topic.

Methods

We followed the established methodologies of systematic reviews as outlined in the Agency for Healthcare Research and Quality (AHRQ) Methods Guide for Effectiveness and Comparative Effectiveness Reviews.[12] The reporting complies with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statements.[13] A protocol was published on AHRQ Effective Health Care website at https://effectivehealthcare.ahrq.gov/products/suicidal-thoughts-youth/protocol and was registered to the International Prospective Register of Systematic Reviews (PROSPERO #: CRD42024537301). The literature search spanned from January 1, 2000, to November 22, 2023.

Results

Sixty-one original studies reported in 75 articles with a total of 14,086 patients were included in this systematic review. Of the 61 included studies, 31 studies were randomized clinical trials (RCTs), 12 were comparative observational studies, and 18 were before-after studies. The median age of the patients was 15.5 years; 74.25% were female. 61% of the patients were White, 18% were African American, and 21% were Hispanic. Five studies evaluated solely or primarily Hispanic adolescents, three studies evaluated solely or primarily African Americans, two studies evaluated solely or primarily American Indians, two studies evaluated solely or primarily lesbian, gay, bisexual, transgender, questioning, or queer (LGBTQ+) youths, and three studies evaluated solely or primarily youths with alcohol/substance-use disorder. Fifty-four studies were

conducted in the United States, six were conducted in Canada, and one was conducted in Mexico. The median followup was 10.53 months, ranging from 1 to 168 months. Twenty-seven studies were exclusively conducted in outpatient clinic settings, six were conducted in school settings, four were conducted in inpatient settings, three were conducted in ED settings, four were conducted through telehealth, one was conducted in a home setting, and sixteen were conducted in multiple settings (i.e., outpatient, inpatient, ED, and telehealth settings).

The psychosocial interventions identified in this review were numerous and diverse. These included: 1) *Psychotherapy Interventions* comprising CBT, DBT, CAMS, ABFT and, FFT; 2) *Acute Interventions* offered mostly in the context of an ED or inpatient setting, interventions characterized as safety planning, motivational interviewing crisis interventions, family-based crisis management interventions, continuity of care following crisis, or brief adjunctive treatments (1 to 4 sessions); and 3) *School/Community-Based Interventions* designed for high risk youths or populations at risk and consisting of social network interventions, school-based skills interventions, suicide awareness/gatekeeper programs, and culturally-tailored, community-based, adjunct treatments.

Traditional Psychotherapy Interventions

Low strength of evidence (SOE) derived from 12 studies suggests that CBT was not superior to treatment as usual (TAU) in reducing SA or SI at long-term followup (1 to 18 months). Of eight RCTs and two comparative observational studies, only one small trial of CBT (n=40 patients) that examined adolescents with suicide risk and a concurrent substance-use disorder found CBT to be superior to enhanced TAU in lowering rates of SA. [14]

Low SOE derived from 11 studies suggests DBT may reduce risk of suicidal outcomes. One large RCT [15] (n=173 patients) of adolescents (aged 12-18 years; 96% were female; 50% were White) found significant reduction of SAs and SI at the end of 6 months, but there were no significant differences on suicidal outcomes at 6 to 12 months, compared to supportive group treatment matched for treatment format and intensity. One small RCT [16] (n=63 patients) enrolled college students (81% were female, 69.8% were white) found DBT superior to a control group matched for treatment format in reducing suicidal ideation at 18 months. While not specifically a DBT treatment, Mode Deactivation Treatment (MDT), a weekly outpatient treatment that combines elements of DBT with those of Acceptance and Commitment Therapy, was compared to TAU in a comparative observational study of adolescent males.[17] This study found significant differences in SAs compared to a weekly individual therapy using a CBT protocol at posttreatment (2 vs 29) with no followup outcome data available. There was limited support for adapted, abbreviated formats of DBT (e.g., skills training only) as offered in the hospital or intensive programs for the reduction of suicidality, hospitalization, or ED visits.

Insufficient SOE from 4 studies suggests that ABFT was not more effective than nondirective family therapy. One small RCT suggested that ABFT was more effective than usual care in reducing SI and suicidal behavior in racially diverse and LGBTQ+youths.[18] Similarly, a single trial of FFT with children and adolescents with mood disorders (aged between 9 and 17 years; 65% were female) found lower but not statistically significant different rates of suicidal events compared to enhanced usual care (mostly involving individual therapy) over a four-year period.

Although before-after studies[19, 20] of CAMS suggested a reduction in suicide, insufficient SOE precluded a conclusion about its effectiveness compared with TAU in reducing suicidal outcomes at followup (1 to 6 months). Moderation analyses found that patients with fewer

borderline personality features and no SAs history had lower suicidal ideation and hopelessness in CAMS, whereas those with higher borderline personality symptoms and multiple SAs did better in TAU. [21]

Acute Interventions

Low SOE derived from 18 studies suggests that acute interventions were associated with no difference in SI and SA at a range of followup from 1 month to 18 months. Two RCTs[22, 23] found minimal support for acute safety planning interventions over care as usual in reducing SI and SA in youths presenting to ED settings or hospitalized for suicide risk. Two RCTs and two comparative observational studies [24-27] found structured, family-based crisis management had fewer hospitalizations but no difference on SA at 1 to18 months followup, compared with standard ED care. Two RCTs [28, 29] and one comparative observational study[30] found no significant difference on suicide outcomes to support followup care or contact (i.e., text or telephone calls) following discharge from the ED for a suicidal crisis. Three RCTs failed to support motivational interviewing crisis interventions offered in the ED or on inpatient psychiatric units over TAU for suicidal adolescents.[31-33] Three RCTs, one comparative observational study and two before-after studies examined brief adjunctive interventions in reducing suicidality on self-report measures.[34-39] These acute interventions included 1-2 session, web- or video-based interventions, and a 4-session, in-person intervention teaching resilience skills with weekly calls and text messages. These six studies found no evidence for such acute interventions in reducing SI.

School/Community-Based Interventions

Low SOE suggests there was no difference in SI or SA up to follow up of 1.5 months to 168 months. Two RCTs[40, 41] failed to find a difference on suicidal outcomes at 12-months between Youth Nominated Support Team (YST), a novel social-support, adjunct treatment in which caring adults are taught to support and check in on suicidal youths on a weekly basis. A secondary analysis found significantly lower rates of mortality in the YST group, suggesting possible effectiveness over the longer-term (11.2 to 14.1 years). Two RCTs[42, 43] found no support compared to control treatments for school-delivery, skills-based individual or group programs in reducing SI or SA.

While an RCT[44] found support for a school-based suicide awareness program and depression screening in increasing students' reporting their peers suicidal risk among high schools with a high prevalence of minority students (59% Hispanic and 20% non-Hispanic African American), only limited evidence exists to support school-based awareness or gatekeeper programs in reducing suicide overall. Finally, three studies (1 comparative observational study[45] and two before-after studies[46, 47]) suggested the possible benefit of culturally-relevant, community-based interventions for decreasing suicide risk among suicidal adolescents within at-risk communities (i.e., Hispanic adolescents, White Mountain Apache tribe members, and Yup'ik communities in Alaska).

Pharmacological/Neurotherapeutic Interventions

We identified only one study examining a pharmacological treatment for suicidal youth. [48, 49] Due to the small size of its medication arm, only the combination treatment arm could be evaluated, which showed significant improvement on depressive symptoms and functioning from

baseline, where 50% achieved remission of depression (Children's Depression Rating Scale [CDRS]< 28) by week 24 but 15.1% of the sample had a suicide attempt by week 24 . As such, the evidence base on pharmacological treatment and neurotherapeutic interventions for suicidal youths is largely nonexistent.

Limitations

This review is limited by the high risk of bias of many of the included studies (42% RCTs, 100% comparative observational studies and before-after studies). Significant heterogeneity in interventions, comparisons, outcomes, and terms used to describe suicide attempts and ascertain suicide risk led to an inability to perform meta-analysis. Most RCTs highlighted here were underpowered and had short followup periods ranging from 1 month to 48 months, with the majority being less than 1 year. Thus, such studies were unable to evaluate rare and distal events such as suicide attempts and deaths. In the context of small sample size and short followup, potentially effective interventions may appear to have limited benefit. Additionally, the replication of positive trials was uncommon.

Psychosocial interventions were diverse and involved multiple therapeutic components. For example, safety planning interventions, which were designed to create a safety plan to manage future high-risk situation, also were enhanced with other therapeutic approaches (e.g., CBT, motivational enhancement), and often included family involvement, followup calls, and other prevention measures (e.g., firearm restriction), making it difficult to determine if safety planning itself, or one of the other treatment components, was the active component. Even treatments examined within the same category (e.g., CBT or DBT) were heterogeneous in format and content, and many included a combination of therapeutic approaches.

Across all studies, there was no assessment of adverse events, an unfortunate omission and ongoing blind spot within the literature at this time when evaluating vulnerable populations susceptible to treatment harm, particularly in the context of the potential for restrictive or involuntary treatments to cause retraumatization [50, 51] [52, 53]

The review was also limited by inherent challenges in suicide research, most prominently, issues related to the measurement of suicide risk in the context of no reliable prediction tools to assess risk, resulting in the reliance on self-report measures of SA, SI, and suicide intent. Self-report measures of suicidal thoughts and behaviors are not only limited by measurement error, but the findings can be biased by psychological distress or conversely, the denial of suicide, in the setting of an intense wish to die or the prospect of an involuntary hospitalization. In addition, SI and suicidal intent commonly fluctuate, which can also make such measures poor predictive tools for future SAs. Finally, the research findings are limited to mostly adolescents (aged 12 to 18 years), and predominantly female-identifying populations. It may not be appropriate to generalize the results to males, youths who are ethnic/racial minorities, latency aged children, and young adults.

Conclusions

This systematic review attempted to evaluate the effectiveness of psychosocial, psychopharmacological, neurotherapeutic, and emerging biological treatments in adolescents at risk for suicide and those from populations deemed at risk. We identified 31 RCTs, 12 comparative observational studies, and 18 before-after studies of psychosocial interventions that were categorized as Traditional Psychotherapy Interventions, Acute Interventions, and School/Community-Based Interventions. This review identified only one observational study on

a combination pharmacological and psychosocial intervention, and no studies on neurotherapeutic treatments, or other biologic treatments in youth. Results suggested insufficient evidence and uncertainty about the benefit of psychosocial interventions over treatment as usual on suicidal thoughts and attempts, including treatments that have shown benefit for suicidal adults (e.g., CBT, DBT, CAMS), and those that have been widely disseminated for suicidal youths, such as DBT and CBT. This uncertainty highlights the importance of common therapeutic factors, such as trust and therapeutic alliance, over specific therapeutic strategies. Given that many of these interventions were adapted from adult protocols (e.g., CBT, DBT, CAMS), our findings suggest the need for the development and evaluation of novel, developmentally informed treatments

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1. Introduction

1.1. Background

Suicide is a leading cause of death in young people and an escalating public health crisis. Suicidal thoughts and behaviors most commonly emerge during the transition from childhood into early adolescence, with the first suicide attempts (SA) typically occurring and peaking in mid-adolescence before decreasing with the transition into young adulthood.[1, 2] In the United States, mortality rates associated with suicide in youth aged 10-24 years have steadily increased since 2007.[3] Over a similar time period, suicide-related emergency department visits for youths aged 5 to 24 years in the United States have risen from 0.9% to 4.2% of all pediatric emergency department visits, with an average annual increase of 23.1%.[4, 5]The prevalence of suicidal ideation and attempts in children under the age of 12 years has also increased from the year 2000 to the year 2020.[6] A systematic review found the lifetime prevalence of suicidal ideation and attempts in preadolescents to be 15.1% and 2.6%, respectively.[7] Seventeen percent of preadolescent children with suicidal ideation go on to try to take their life, and male children have a higher suicide rate than female children.[7]

Despite the alarming increase in suicidal thoughts, behaviors, and suicide deaths among young people, there are few evidence-based guidelines to inform the implementation of preventive interventions for children, adolescents, and young adults at high risk for suicidal thoughts and behaviors. In practice, treatments for suicidal thoughts and behaviors typically include psychosocial and pharmacological interventions or their combination, although most of the supporting evidence has been extrapolated from studies on adults.[8, 9]

1.1.1. Psychosocial Interventions

A wide variety of psychosocial interventions have been developed for reducing suicidal thoughts and behaviors in young people. Broadly, psychosocial interventions provide some combination of support, skill development, problem solving, emotion regulation and management, behavioral planning, family engagement and communication training, and practical safety planning, including limiting access to lethal means, such as firearms.[9-14] Not only do the components differ, the interventions vary in terms of format (e.g., individual, family, group), setting (e.g., outpatient, inpatient, emergency department [ED], technology), intensity, and duration. Evidence to support these interventions is mixed. Two meta-analyses found psychosocial interventions were superior to control interventions with regard to self-harm behavior (i.e., suicidal and/or nonsuicidal in nature).[15, 16] However, a large sy sematic review sfound that active treatments were not more effective than control interventions.[9] In spite of these null findings, the included studies evaluated a heterogeneous group of interventions that combined treatments ranging from single- session, acute interventions to multi-component, intensive treatments. Studies were also limited to youth under the age of18 years. As such, methodological issues may have obscured the ability to identify promising treatments.[9]

Aside from screening practices for suicide in youth, there are few definitive treatment guidelines for suicidal youth. The existing guidelines offer varying recommendations for psychosocial treatments in suicidal youth. The American Academy of Child and Adolescent Psychiatry (AACAP) recommends treatment options such as cognitive behavioral therapy (CBT), interpersonal psychotherapy for depressed adolescents (IPT-A), dialectical behavior therapy (DBT), psychodynamic therapy, and family therapy.[17] Yet it is unclear whether this

recommendation rests on currently available evidence. According to the United States Preventative Services Task Force systematic review on screening for depression and suicide Risk in children and adolescents, there is limited evidence for any psychosocial treatment.[18] However, guidelines from Substance Abuse and Mental Health Services (SAMHSA) describes dialectical behavior therapy for adolescents (DBT-A) as evidence based and considers Attachment Based Family Therapy, Multisystemic Therapy-Psychiatric, Safe Alternatives for Teens and Youth, Integrated CBT, and Youth Nominated Support Team Intervention for Suicidal Adolescents to have moderate strength of evidence. Given the importance of this topic, more clarity on evidence-based psychosocial interventions is needed.

1.1.2. Pharmacological Interventions

Current practice guidelines are equivocal on whether medication should be recommended. The SAMHSA treatment guideline acknowledges that there is no evidence for the use of selective serotonin reuptake inhibitors (SSRIs) or other pharmacological treatments for suicidal youth but outlines medications that have been approved for the treatment of comorbid conditions. AACAP states that SSRIs may be considered for the treatment of suicidal youth based on evidence that they reduce suicidal ideation and attempts in nondepressed adults with cluster B personality disorders and that lithium shows benefit in reducing the rates of SA in adults with bipolar disorder.[17] Recommendations to treat with antidepressants such as SSRIs are based on studies of youth with major depressive disorder (MDD).[19, 20] However, most trials excluded suicidal adolescents,[21] and meta-analyses of SSRI studies suggest a small, but significant, increased risk of suicidal thoughts and behaviors in adolescents, leading the U.S Food and Drug Administration to institute a black box warning for increased risk of suicidal thoughts and behaviors in children, adolescents, and young adults taking antidepressants for MDD and other psychiatric disorders.[22, 23] While other pharmacological agents such as selective norepinephrine reuptake inhibitors, lithium, clozapine, ketamine, esketamine, and psychedelic treatments have been suggested as potential treatments for suicidal thoughts and behaviors in young people based on some benefit for adults, it is unclear whether these pharmacological agents improve suicidal outcomes for adolescents.[8, 24-26] Because combination treatment with medication and psychotherapy is common practice,[27] it is important to understand the potential risks and benefits of pharmacotherapy for young people with suicidal thoughts and behaviors.

1.1.3. Other Psychiatric Interventions

Neurotherapeutics or neuromodulatory interventions such as electroconvulsive therapy and transcranial magnetic stimulation have been studied for the treatment of suicidal thoughts and behaviors in adults. At this time, it is unclear whether they prove effective for adolescents and young adults.

1.2. Purpose of the Review

This systematic review aims to assess the effectiveness and harms of treatments for suicidal thoughts and behaviors in children, adolescents, and young adults. Data on effect modifiers of the effectiveness and harms will also be synthesized when available. This work will be used by the American Psychological Association to develop a new clinical practice guideline on this topic.

2. Methods

2.1. Review Approach

The systematic review follows the established methodologies of systematic reviews as outlined in the Agency for Healthcare Research and Quality (AHRQ) Methods Guide for Effectiveness and Comparative Effectiveness Reviews.[28] The reporting complies with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statements.[29] The final protocols are registered in the International Prospective Register of Systematic Reviews (PROSPERO #: CRD42024537301) and posted on the AHRQ Effective Health Care website at https://effectivehealthcare.ahrq.gov/products/suicidal-thoughts-youth/protocol.

2.2. Key Questions

KQ 1. For youth, what are the effectiveness, comparative effectiveness, and harms of treatments for suicidal thoughts and behaviors?

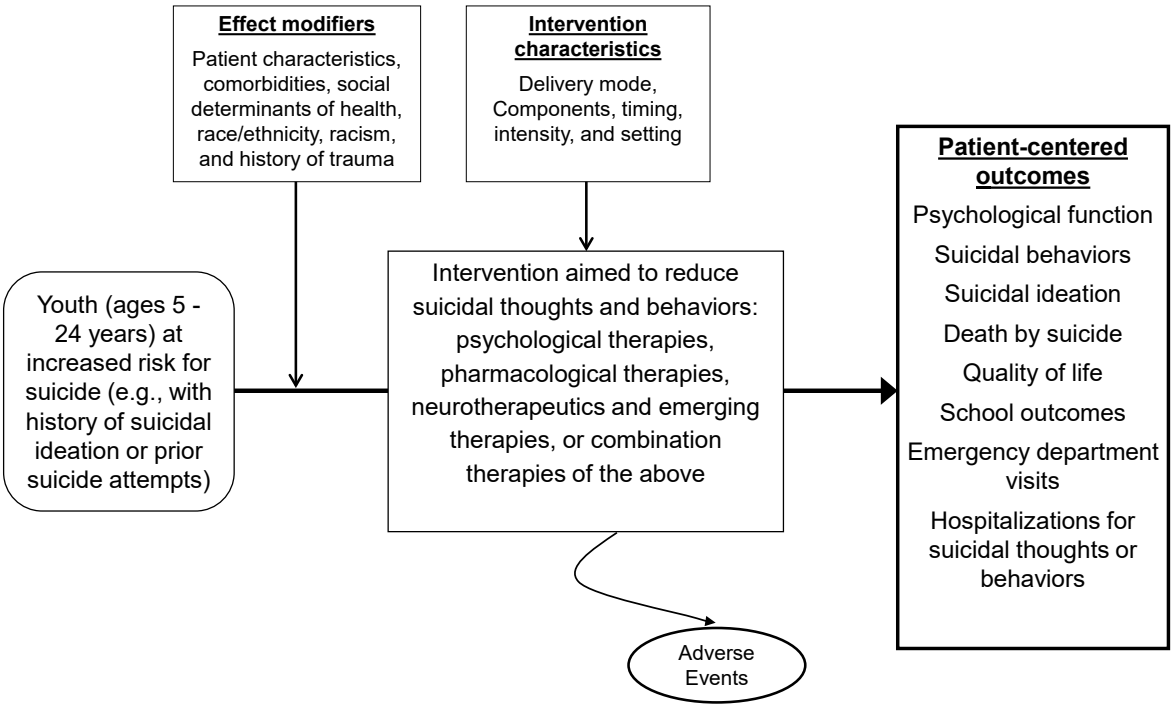
a. What are the components of effective psychosocial treatments (e.g., frequency or intensity of therapy and/or aspects of the therapeutic modality)?

b. How do social determinants of health, racism and disparities, care delivery methods, patient demographics and psychiatric or developmental co-occurring conditions affect outcomes?

The Key Questions (KQ) were posted for public comment between July 17, 2023, and August 04, 2023. We recruited eight Key Informants and five Technical Experts with different expertise and backgrounds and obtained input on the study protocol through four 1-hour video conference calls. The Key Informant calls were held on October 30, 2023, and November 20, 2023, and the Technical Expert Panel calls were held on February 23, 2024, and March 14, 2024. The public comments, Key Informants, and Technical Experts emphasized the public health implications and importance of the topic, citing the increasing trend of suicide in youths. The Technical Experts also provided critical suggestions on evaluating outcomes by the timing of occurrence and specific scales used to measure the severity of suicidal ideation (SI). They recommended specific age categorizations and advised evaluation of the scalability of interventions, citing that some treatments, such as dialectical behavior therapy (DBT), although having evidence of efficacy, require long-term training and commitment, and thus have high dropout rates and are not easily scalable. In response, we synthesized outcomes at the end of the intervention and at the longest followup. We also added examples of scales that are commonly used to measure SI and intent and changed the age categorization.

2.3. Analytic Framework

Figure 1. Analytic framework



2.4. Study Selection

2.4.1. Search Strategy

We searched several bibliographic databases, including Embase® Epub Ahead of Print, In-Process & Other Non-Indexed Citations, MEDLINE® Daily, MEDLINE®, Cochrane Central Register of Controlled Trials, Ovid® Cochrane Database of Systematic Reviews, and Scopus® from January 1, 2000, to November 22, 2023. We also searched the U.S. Food and Drug Administration, ClinicalTrials.gov, Health Canada, U.K. Medicines and Healthcare Products Regulatory Agency (MHRA), conference proceedings, patient advocate group, and medical society websites. We conducted reference mining of existing systematic reviews/meta-analyses, completed trials identified from clinical trial registries, and relevant primary studies to identify additional literature. In addition, a Supplemental Evidence and Data for Systematic Reviews (SEADS) portal, which collected additional study-specific information from industry stakeholders, professional societies, and researchers was open from 05/02/2024 to 06/21/2024, was created on the Effective Health Care website and publicized on the Federal Register. The literature search strategy was developed by an experienced medical librarian and peer-reviewed by an independent information specialist. The same medical librarian conducted the literature search. The detailed search strategies are listed in Appendix A.

2.4.2. Inclusion and Exclusion Criteria

The eligible studies for the KQ had to meet all of the following criteria: (1) enrolled children, adolescents, and young adults aged between 5-24 years who had a heightened risk of suicide, (2) evaluated psychosocial interventions, pharmacological therapies, neurotherapeutics, emerging therapies, or a combination, (3) compared the intervention with treatment as usual, another psychosocial intervention, another pharmacological therapy, or a combination, (4) reported outcomes of interest (e.g., suicidal behaviors, SI, death by suicide, hospitalizations for suicidal thoughts or behaviors, measures of psychological functioning, school outcomes, and adverse events), (5) were randomized clinical trials (RCTs), comparative observational studies, or before-after studies, (6) were published in English as peer reviewed full-text publications, (7) were published after the year 2000, and (8) were conducted in the United States (U.S.), Canada, or Mexico (to have more applicable findings to the U.S. population).

In this study, we defined heightened risk of suicide as any of the following conditions:

- Previous SI (i.e., thinking about or planning suicide) with or without self-injurious behaviors (i.e., suicide attempt [SA] or self-injurious behavior, including self-directed deliberate injury or potential for injury)
- Previous SAs in the absence of known SI
- Recent hospital discharge for mental health treatment
- Command hallucination (i.e., auditory hallucinations that instruct a patient to act in specific manners) or intense stress/distress
- Identified as having heightened risk by the Patient Health Questionnaire (PHQ)-9, Columbia-Suicide Severity Rating Scale (C-SSRS), or Ages and Stages Questionnaire (ASQ)
- Identification as part of a racial/ethnic minority group, the lesbian, gay, bisexual, transgender, questioning, or queer (LGBTQ+), or other community known to have increased risk of suicide
- Exposure to high crime/violence

We excluded studies that included adults aged ≥25 years, studies that evaluated complementary or integrative health interventions (e.g., light therapy, supplements), nonoriginal studies (e.g., narrative reviews, editorials, erratum), and cross-sectional studies. The detailed inclusion and exclusion criteria for the KQ are listed in Table 1.

2. Methods

Table 1. PICOTS (population, interventions, comparators, outcomes, timing, setting)

PICOTS Elements	Inclusion Criteria	Exclusion Criteria
Population	• Ages 5–24 years who have a heightened risk for suicide, including— o Those who have suicidal ideation (i.e., thinking about or planning suicide) with or without self-injurious behaviors (i.e., suicide attempt or self-injurious behavior, including self-directed deliberate injury or behaviors with potential for injury) o Those who have made suicide attempts o Those who have a recent hospital discharge for mental health treatment o Those who have shown command hallucination (i.e., auditory hallucinations that instruct a patient to act in specific manners) or intense stress/distress o Those who are identified as having heightened risk by PHQ-9, C-SSRS, or ASQ o Those who are from racial/ethnic minority groups known to have increased risk of suicide o Those who are from the LGBTQ+ community o Those who have/had exposure to high crime/violence	• Adults aged >25 years
Interventions	• An intervention aimed to reduce suicidal and thoughts behaviors— o Psychosocial interventions o Pharmacological therapy o Neurotherapeutics and emerging therapies o Combination therapies of the above	• Complementary or integrative health interventions (e.g., light therapy, supplements)
Comparators	• Treatment as usual • Another psychosocial intervention • Another pharmacological therapy • Combination therapies of the above	• None
Outcomes	• Suicidal behaviors (e.g., suicidal attempts, self-harm with suicidal intent, self-harm without suicidal intent) • Suicidal ideation • Measures of severity of suicide ideation and intent (e.g., C-SSRS, Sheehan STS, SIQ) • Deaths by suicide • Hospitalizations for suicidal thoughts or behaviors • Emergency department visits for suicidal thoughts or behaviors • Measures of psychological functioning after receiving an intervention targeting suicidal behaviors and thoughts (e.g., depression, anxiety, stress, coping, sense of purpose, agency, burdensomeness, thwarted belonging as reported by child and caregivers, quality of life • School outcomes (e.g., functioning in school, attendance, drop-out) • Adverse events, such as withdrawal from therapy and retraumatization	• None
Timing	• At the end of intervention and at the end of followup	• None
Settings	• Any (e.g., outpatient, inpatient, emergency department) in the U.S., Canada, and Mexico	• None

PICOTS Elements	Inclusion Criteria	Exclusion Criteria
Study Design	• RCTs • Comparative observational studies • Before-after studies • Relevant systematic reviews, or meta-analyses (used for identifying additional studies)	• In vitro studies • Nonoriginal studies (e.g., narrative reviews, editorials, letters, or erratum), • Cross-sectional (i.e., nonlongitudinal) studies
Subgroup Analysis	• Delivery methods/setting (e.g., telehealth, in-home treatment, school-based intervention, clinic) • Age group (5–13 years, 14–17 years, and 18–24 years) • Gender/gender identity • Race/ethnicity • History of trauma • Experience of racial/ethnic discrimination and marginalization • Sexual orientation • Co-occurring conditions (e.g., MDD, bipolar disorder, mood disorders, substance use disorders, eating disorders, posttraumatic stress disorder, autism, intellectual/developmental disabilities, other special needs), • Intervention objectives (i.e., addressing suicidal thoughts vs. suicidal behaviors; ongoing treatments following crisis care vs. crisis care) • Clinical settings (e.g., outpatient, inpatient, residential, emergency department) • Timing of outcome assessment (e.g., long-term outcome assessment, short-term outcome assessment) • Social determinants of health (e.g., access to mental healthcare, access to housing, poverty, exposure to violence/crime)	• None
Publications	• Full-text peer-reviewed studies published in English • Studies published after the year 2000	• Non-English language studies • Conference abstracts

Abbreviations: ASQ = Ages and Stages Questionnaire; C-SSRS = Columbia-Suicide Severity Rating Scale; LGBTQ+ = lesbian, gay, bisexual, transgender, questioning, or queer; MDD = major depressive disorder; PHQ-9 = Patient Health Questionnaire 9; RCT = randomized clinical trial; SIQ = Suicidal Ideation Questionnaire; Sheehan STS = Sheehan Suicide Tracking Sheet; U.S. = United States

2.4.2.1. Study Selection

Pairs of independent reviewers screened the titles and abstracts for all citations using prespecified inclusion and exclusion criteria. Studies included by either reviewer were retrieved for full-text screening. Independent reviewers, again working in pairs, screened the full-text version of eligible references. Discrepancies between the reviewers were resolved through discussions and consensus. When consensus could not be reached, a third reviewer resolved the difference.

2.4.3. Data Extraction

We developed a standardized data extraction form to extract study characteristics (e.g., author, year, study design, inclusion and exclusion criteria, patient characteristics, intervention, comparisons, outcomes, length of followup, effect modifiers, and related items for assessing

study quality and applicability). The standardized form was tested by all study team members using 10 randomly selected studies.

Each reviewer worked independently to extract study details. A second reviewer reviewed the data extraction and resolved conflicts. When the included studies did not report all necessary information (e.g., methods and results), we contacted authors directly. DistillerSR® was used to create data extraction forms and facilitate data extraction.

2.4.4. Risk of Bias Assessment

For RCTs, we evaluated the risk of bias of the included RCTs using the Cochrane Collaboration's Risk of Bias 2 tool[30] to assess bias from the randomization process, deviation from intended interventions, missing outcome data, outcome measurement, selective reporting, and other sources of potential bias. For comparative and single-arm observational studies, we selected appropriate items from the Newcastle-Ottawa Scale.[31] One reviewer independently rated risk of bias for all studies. A second reviewer reviewed the ratings and resolved conflicts.

2.4.5. Data Synthesis and Analyses

We qualitatively summarized key features and characteristics of the included studies and present the findings in evidence tables.

Table 2 lists the definitions we used to categorize psychosocial interventions.

Table 2. Definitions of psychosocial interventions

Category	Definition
Traditional Psychotherapy	Individual or group-based psychological treatments that were originally designed for implementation in outpatient settings. These treatments are generally conducted over multiple sessions over the course of several weeks or months. Most of these treatments involve multiple treatment strategies and components (e.g., family, parent, or individual sessions). A few interventions included within this category consisted of adaptations of standard outpatient treatment protocols for implementation within intensive settings (e.g., intensive outpatient, inpatient, or residential programs).
Cognitive Behavioral Therapy (CBT)	Outpatient treatments that are based on the view that suicide attempts are the product of maladaptive thoughts and behaviors in response to stressors. Interventions generally involve psychoeducation, problem-solving training, cognitive restructuring, coping skills (e.g., relaxation, distraction, emotion regulation), and interpersonal communication skills. Many of these interventions also addressed ecological factors to mitigate risk (e.g., family support, parent depression).
Dialectical Behavior Therapy (DBT)	A highly structured, intensive, multi-component program consisting of weekly group and individual therapy, as well as family skills groups, telephone coaching, and weekly team consultation. DBT involves therapeutic techniques and skills to target deficits in emotion regulation, interpersonal, behavioral, and cognitive deficits. DBT includes four main skill domains (i.e., mindfulness, distress tolerance, emotion regulation, interpersonal effectiveness) taught to address suicidal behaviors.
Attachment-Based Family Therapy (ABFT)	A manualized family therapy designed to address family processes such as family problem solving, affect regulation, and organization of family relationships to buffer the adolescent against suicidal thinking and behaviors.

Category	Definition
Family-Focused Therapy (FFT)	A modification of behavioral family management therapy for patients with schizophrenia. The treatment consists of family sessions that include psychoeducation, communication skills training, and problem-solving skills training designed to reduce family-expressed emotion or family criticism, familial hostility, or familial overinvolvement directed towards the patient.
Collaborative Assessment and Management of Suicidality (CAMS)-Based Psychosocial Treatments	An individualized outpatient therapy approach that targets youth-defined drivers of suicidal thoughts and behaviors. CAMS is guided by the Suicide Status Form (SSF), which is used to identify risks and contributors to risk as well as in planning for how to address those problems until suicidal thinking and behavior are resolved.
Acute Intervention	Single-session treatments offered mostly in the context of an emergency department or inpatient setting with or without followup contacts, can also be 1 to 4 session adjunct treatments or continuity of care interventions (e.g., telephone calls, single outpatient visit) following crisis stabilization.
Family-Based Crisis Management	Interventions offered within the context of an emergency department visit for a suicidal crisis. Family-Based Crisis Management typically includes psychoeducation, cognitive behavioral skill building, and safety planning, along with motivation enhancement to engage the youths in outpatient treatment.
Motivational Interviewing Crisis Intervention	Interventions offered within the emergency department that were based on the self-determination theory of self-regulation and change, designed to enhance treatment engagement and motivation for change following a suicidal crisis. Many of these treatments include case management or followup.
Safety Planning	An acute, collaborative intervention offered within the emergency department or in inpatient settings designed to help youths identify warning signs for suicide along with concrete strategies, supportive contacts, and resources to mitigate future crises.
Continuity of Care	An intervention that provides telephone- or text-based supportive contacts to enhance safety (e.g., review safety plan, means restriction) and may also include an outpatient followup appointment within one week after discharge from the hospital along with a telephone contact.
Brief Adjunctive Treatment	A brief (one to four session) intervention intended to provide youths with additional skills or support in conjunction with standard outpatient or inpatient care.
School-Based/Community-Based Intervention	Psychosocial interventions designed for implementation within a school or community setting designed to enhance skills and/or social support for high-risk youths.
Social Network Intervention	An intervention designed to be adjunctive treatments that enhance social support for suicidal youths.
School-Based Skills Intervention	A type of intervention delivered within the school setting, designed to enhance coping skills for youths at risk for suicide.
Suicide Awareness/Gatekeeper Program	A program designed to enhance student and/or staff members awareness of red flags for suicide in students to help them identify and report students at risk and link them with services.
Community-Based, Culturally Tailored Adjunct Program	A program designed specifically for high-risk youths or youths from communities at risk. The program uses cultural considerations to inform multi-component treatments designed to target risks and specific barriers to treatment within communities at risk.

Abbreviations: ABFT = Attachment-Based Family Therapy; CAMS = Collaborative Assessment and Management of Suicidality; CBT = cognitive behavioral therapy; DBT = dialectical behavior therapy; FFT = Family-Focused Therapy; SSF = Suicide Status Form

Due to substantial heterogeneity of the included studies, especially heterogeneity in interventions, we were unable to conduct meta-analysis to quantitatively pool findings across studies.

2.4.6. Grading the Strength of Evidence

We graded the strength of evidence (SOE) for KQs following the AHRQ Methods Guide for Effectiveness and Comparative Effectiveness Reviews.[28]

SOE derived from observational studies started as low whereas SOE derived from RCTs started as high.[28] SOE was rated down due to methodological limitations of the studies (i.e. risk of bias), imprecision (based on the size of the body of evidence, number of events, and confidence intervals), indirectness of the evidence to the KQs (focusing on whether the outcomes were important to patients vs. surrogate outcomes), inconsistency of results (based on qualitative and statistical approaches to evaluate for heterogeneity), or increased likelihood of reporting and publication bias. SOE could be increased if a dose-response gradient was credible, consistent, and reproduced across multiple studies. Considering that meta-analysis was not feasible, we leveraged an approach in which the same SOE domains were judged in the absence of a single estimate of effect.[32]

Based on this assessment and the initial study design, we assigned SOE ratings as high, moderate, low, or 'insufficient' (Table 3).

Table 3. Definition of strength of evidence ratings

SOE Rating	Definition
High	We are very confident that the estimate of effect lies close to the true effect (i.e., the body of evidence has few or no deficiencies and is judged to be stable).
Moderate	We are moderately confident that the estimate of effect lies close to the true effect (i.e., the body of evidence has some deficiencies and is judged to be likely stable).
Low	We have limited confidence that the estimate of effect lies close to the true effect (i.e., the body of evidence has major or numerous deficiencies and is likely unstable).
Insufficient	We have no evidence, are unable to estimate an effect, or have no confidence in the estimate of effect.

Abbreviations: SOE = strength of evidence

2.4.7. Assessing Applicability

We followed the procedures outlined in the AHRQ Methods Guide for Effectiveness and Comparative Effectiveness Reviews to assess the applicability of the findings within and across studies.[28] Applicability for each outcome was summarized and presented qualitatively using the PICOTS framework and not a specific checklist or scale. The following factors that may affect applicability have been identified, including patient factors (e.g., age, gender, race, ethnicity, socioeconomic status, geographic location), settings, and study design features (e.g., observational studies, RCTs). For psychosocial therapies, applicability and scalability of interventions was also considered. We used this information to evaluate the applicability of the evidence to real-world clinical practice in typical U.S. settings. We reported any limitations in applicability of individual studies in the evidence tables and limitations of applicability of the whole body of evidence in the summary of evidence tables.

2.4.8. Peer Review and Public Commentary

To be added in the final version of the report.

3. Results

3.1. Literature Search and Evidence Base

The literature search identified 25,995 citations. We excluded 24,561 articles after abstract screening, and 1,250 articles were excluded after full-text screening. The main reasons for exclusion were if the study did not meet the inclusion criteria for the study population (n=489), if the intervention/exposure and comparison (n=161) or outcomes (n=124) were not of interest, if the study design (n=247 was not applicable, if the study was a conference abstract (n=196), or the study was no in English (n=33). We also identified 66 trial registrations through clinical trial registries. As a result, 61 original studies reported in 75 articles with a total of 14,086 patients met the inclusion criteria.[14, 33-106] The results of the literature search are displayed in the flow chart in Appendix B. The excluded studies with reasons for exclusion are included in Appendix C.

Of the 61 included studies, 31 studies were randomized clinical trials (RCTs),[14, 33, 36, 48, 49, 52, 54, 55, 59, 62-65, 67, 69-72, 78, 79, 81, 84-86, 90, 91, 93, 98, 101, 102, 106] 12 were comparative observational studies,[41, 50, 57, 80, 87, 92, 94-96, 99, 104, 105] and 18 were before-after studies.[35, 37-39, 44-47, 58, 66, 68, 73-77, 83, 100, 103] The median age of the patients was 15.5 years; 74.25% were female. Sixty-one percent of the patients were White, 18% were African American, and 21% were Hispanic. Five studies evaluated solely or primarily Hispanic adolescents,[36, 38, 73, 75, 93] three studies evaluated solely or primarily African American youths,[33, 86, 104] two studies evaluated solely or primarily Native American youths,[74, 99] two studies evaluated solely or primarily lesbian, gay, bisexual, transgender, questioning, or queer (LGBTQ+) youths,[44, 83] and three studies evaluated solely or primarily youths who had an alcohol/substance use disorder. 50.24% of the patients reported previous suicide attempts (SA). Fifty-four studies were conducted in the United States, six were in Canada, and one was in Mexico. The median followup period was 10.53 months, ranging from 1 to 168 months. Eleven studies were published before 2010. Twenty-seven studies were exclusively conducted in outpatient clinic settings; six were exclusively conducted in school settings; four were exclusively conducted in inpatient settings; four exclusively conducted through telehealth; three were exclusively conducted in emergency department (ED) settings; one study was exclusively conducted in a home setting; and 16 were conducted in multiple settings (i.e., outpatient, inpatient, ED, and telehealth settings). Appendix D lists the study characteristics. Details of the interventions used in each study can be found in Appendix E. Risk of Bias assessments can be found in Appendix F, and Appendix G lists the appendix references.

3.2. Key Questions

KQ: For youth, what are the effectiveness, comparative effectiveness, and harms of treatments for suicidal thoughts and behaviors?

a. What are the components of effective psychosocial treatments (e.g., frequency or intensity of therapy and/or aspects of the therapeutic modality)?

b. How do social determinants of health, racism and disparities, care delivery methods, patient demographics and psychiatric or developmental co-occurring conditions affect outcomes?

3.2.1. Key Points

- The current body of evidence is derived primarily from female youths aged 12 to 18 years, who were racially and ethnically diverse, and who had depression, bipolar disorder, or SI.
- Low strength of evidence supports that dialectical behavior therapy (DBT) may reduce suicidal ideation (SI) and nonsuicidal self-injury (NSSI) when administered as a multi-component treatment over 6 months. However, this effectiveness was not durable and did not differ from individual and group supportive therapy at 6 to 12 months followup. Evidence supporting an effect on other outcomes such as SAs, ED visits and hospital admissions is insufficient. Evidence supporting shorter or modified versions of DBT is insufficient.
- Low strength of evidence supports that cognitive behavioral therapy (CBT) may be associated with a trivial or no effect on SI, SAs, or self-injury.
- The current evidence is insufficient to support an effect of several psychosocial therapies on SI and SAs in children, adolescents, and young adults, including Collaborative Assessment and Management of Suicidality (CAMS), Attachment-Based Family Therapy (ABFT), and Family-Focused Therapy (FFT).
- The current evidence is insufficient for acute interventions delivered in the ED or following discharge on SI and SAs in children, adolescents, and young adults. This includes safety planning, family-based crisis interventions, motivational interviewing crisis interventions, continuity of care following crisis, and brief adjunctive treatments.
- The current evidence is insufficient to support an effect of school/community-based psychosocial interventions on SI and SAs in children, adolescents, and young adults, including social network interventions, school-based skills interventions, suicide awareness/gatekeeper programs, and community-based, culturally tailored adjunct programs.
- The evidence base on pharmacological treatment for suicidal youths is largely nonexistent at the present time. No eligible study evaluated neurotherapeutics therapies for these age groups.
- The uncertainty about the effectiveness of most interventions compared with group or supportive care suggests that the nonspecific therapeutic factors common to all psychotherapeutic approaches and supportive treatments, such as empathy, therapeutic alliance, and contact with the healthcare system, might contribute to outcomes more than the therapeutic strategies themselves.

3.2.2. Key Question Results

Meta-analysis was not feasible due to substantial heterogeneity across the included studies. A narrative description of the result of each study is presented. Table 4 summarizes judgments about the strength of evidence.

Table 4. Strength of evidence judgments derived from randomized clinical trials and comparative observational studies

Intervention	Body of Evidence	Risk of Bias Level	SOE Domains	SOE Rating
Traditional Psychotherapy: Cognitive Behavioral Therapy (CBT)	8 RCTs 2 comparative observational studies. 751 patients	4 studies with moderate risk and 6 studies with high risk	Imprecise estimates with CI that includes appreciable benefits and harms	Low SOE consistent with no difference in suicidal ideation, suicidal attempts, or self-injury
Traditional Psychotherapy: Dialectical Behavior Therapy (DBT)	2 RCTs 5 comparative observational studies. 1,318 patients	2 studies with moderate risk and 5 studies with high risk	Imprecise estimates with CI that includes appreciable benefits and harms Inconsistency with the outcome of suicide attempts Indirectness of evidence when extrapolating from rigorous long-term interventions to modified or shortened interventions	Low SOE for reducing suicidal ideation or nonsuicidal self-harm Insufficient SOE for reducing suicidal attempts, ED visits, and readmission
Traditional Psychotherapy: Attachment-Based Family Therapy (ABFT)	2 RCTs 195 patients	2 studies with high risk	Imprecise estimates with CI that includes appreciable benefits and harms Inconsistency between the 2 RCTs (i.e., the larger one did not show reduction in suicidal ideation, but the smaller one did)	Insufficient SOE for reducing suicidal ideation or suicide attempts
Traditional Psychotherapy: Family-Focused Therapy (FFT)	1 RCT 127 patients	1 study with high risk	Serious imprecision due to a single small study with a small number of events	Insufficient SOE for reduced suicidal ideation or suicidal attempts
Traditional Psychotherapy: Collaborative Assessment and Management of Suicidality (CAMS)-Based Psychosocial Treatments	1 RCT 62 patients	1 study with moderate risk	Serious imprecision due to a single small study with a small number of events	Insufficient SOE for reduced suicidal ideation or suicide attempts
Acute Interventions: Family-Based Crisis Management	2 RCTs 2 comparative observational studies 710 patients	2 studies with moderate risk and 2 studies with high risk	Small body of evidence, imprecise estimates with CI that includes appreciable benefits and harms	Low SOE consistent with no difference in suicidal ideations or suicide attempts

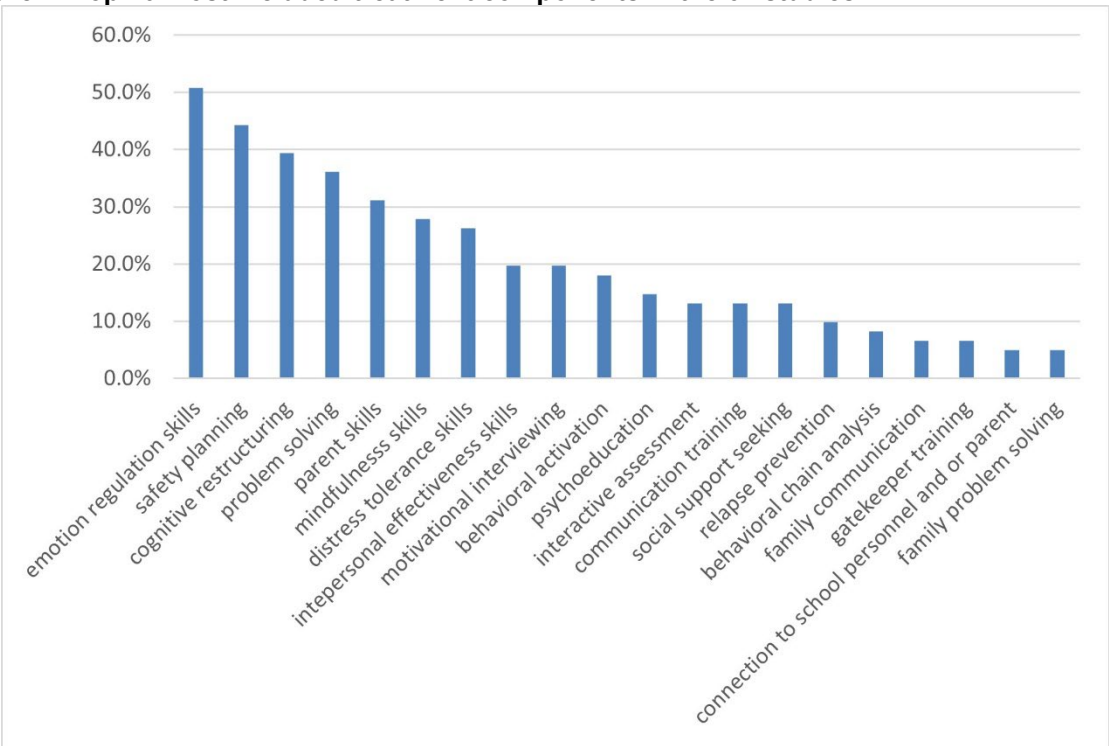
3. Results

Intervention	Body of Evidence	Risk of Bias Level	SOE Domains	SOE Rating
Acute Interventions: Motivational Interviewing Crisis Interventions	3 RCTs 267 patients	3 studies with moderate risk	Small body of evidence, imprecise estimates with CI that includes appreciable benefits and harms	Low SOE consistent with no difference in suicidal ideations or suicide attempts
Acute Interventions: Safety Planning	2 RCTs 102 patients	2 studies with moderate risk	Small body of evidence, imprecise estimates with CI that includes appreciable benefits and harms	Low SOE consistent with no difference in suicidal ideations or suicide attempts
Acute Interventions: Continuity of Care	2 RCTs 1 comparative observational study 508 patients	3 studies with high risk	Small body of evidence, imprecise estimates with CI that includes appreciable benefits and harms	Low SOE consistent with no difference in suicidal ideations or suicide attempts
Acute Interventions: Brief Adjunctive Treatments	3 RCTs 1 comparative observational study 940 patients	2 studies with moderate risk and 2 studies with high risk	Small body of evidence, imprecise estimates with CI that includes appreciable benefits and harms	Low SOE consistent with no difference in suicidal ideations or suicide attempts
School-Based/Community-Based Interventions	5 RCTs 1 comparative observational study. 3,696 patients	1 study with moderate risk and 5 studies with high risk	Imprecision within each category of intervention	Low SOE consistent with no difference in suicidal ideation or suicide attempts

Abbreviations: ABFT = Attachment-Based Family Therapy; CAMS = Collaborative Assessment and Management of Suicidality; CBT = cognitive behavioral therapy; CI = confidence interval; DBT = dialectical behavior therapy; FFT = Family-Focused Therapy; RCT = randomized clinical trial; SOE = strength of evidence

Figure 2 lists the top 20 commonly used treatment components reported by the 61 studies. Emotion regulation skills were the most used component included in the psychosocial interventions (50.8%), followed by safety planning (44.3%), cognitive restructuring (39.3%), and parent skills (31.1%).

Figure 2. Top 20 most included treatment components in the 61 studies



3.2.2.1. Traditional Psychotherapy Interventions

Traditional psychotherapy interventions comprised individual or group-based psychological treatments that were originally designed for implementation in outpatient settings, such as CBT, DBT, CAMS, and ABFT. These treatments are generally conducted over multiple sessions over the course of several weeks or months. Most of these treatments involved multiple treatment strategies and components (e.g., family, parent, and individual sessions). A few interventions included within this category consisted of adaptations of standard outpatient treatment protocols for implementation within intensive settings (intensive outpatient, inpatient or residential programs) [40, 57, 92, 105]

3.2.2.1.1. Cognitive Behavioral Therapy

CBT interventions comprise outpatient treatments that are based on the view that SAs are the product of maladaptive thoughts and behaviors in response to stressors. Interventions generally involve psychoeducation, training in problem-solving, cognitive restructuring, development of coping skills (e.g., relaxation, distraction, and emotion regulation), and development of interpersonal communication skills. Many of these interventions also address ecological factors to mitigate risk (e.g., family support and parent depression).

CBT was evaluated in twelve original studies reported in 16 articles with a total of 1,126 patients.[36, 50, 55, 62, 66, 72, 75, 79, 85, 87, 91, 98] Eight studies were RCTs,[36, 55, 62, 72, 79, 85, 91, 98], two studies were comparative observational studies,[50, 87] and two studies were before-after studies.[66, 75] The median age of the patients was 15.82 years (range: 14.34–21 years); 73.28% were female. 78.91% of the patients were White, 9.96% were African American, and 27.82% were Hispanic. One study exclusively evaluated Hispanic youth. 60.21% of the patients reported previous SAs. Eleven studies were conducted in the United States, and one was conducted in Canada. The

median followup period was 10.25 months, ranging from 1 to 18 months. Two studies were published before the year 2010. Eight studies were conducted in a clinic setting; one in a community setting, and three were conducted in multiple settings (e.g., clinic, inpatient, in-home, and through telehealth). The descriptions and main findings of the individual studies are listed in Table 5. Appendix Table D.1 lists study characteristics. Details of the interventions used in each study can be found in Appendix Table E.1.

Appendix Table F.1 lists the risk of bias assessments for each study. The overall risk of bias for the RCTs was moderate to high due to the high risk of missing outcome data, and the moderate risk for deviations from the intended interventions (Appendix Table F.1.1). All comparative observational studies and before-after studies were rated as high risk of bias (Appendix Table F.2.2 and F.2.3).

Table 5. Description and main findings of individual studies for cognitive behavior therapy

Author, Year, Study Design	Description	Main findings
Duarte-Velez et al., 2022[36], RCT	A socio-cognitive behavior therapy (socio-CBT)/ culturally centered CBT protocol for Hispanic adolescents with suicidal behaviors was compared with treatment as usual. Socio-CBT therapy followed CBT's principals but incorporated ecological, cultural, and developmental perspectives to improve identity integration and incorporated the family environment to improve suicidal behaviors. Treatment as usual (TAU) included CBT techniques, psychoeducation, and emphasized family support with the sessions focusing on the adolescents' and/or caregivers' most pressing concerns. Participants in both interventions received 1.5-to-3-hour, home-based sessions ranging from 6 to 14 weeks and psychotropic medication as part of standard clinic procedures. In this study, 46 Hispanic adolescents (13–17 years) with active SI within the last month or an SA within the last 2 months were included. In this study, over 80% of the sample was female. Adolescents were randomized to Socio-CBT or TAU. Both conditions were delivered in the home setting.	Both groups showed significant improvements over time; however, at 12 months, there was no significant difference between the two groups on SA (d=0.4), child-reported depressive symptoms (measured by the Children's Depression Inventory [CDI], d=0.6), child-reported internalizing symptoms (measured by the Youth Self-Report [YSR]-internalizing scale, d=0.5), child-reported SI (measured by the Suicidal Ideation Questionnaire-Junior [SIQ-JR], d<0.05), and parent-reported internalizing symptoms (measured by the Child Behavior Checklist [CBCL], d=0.6). There was no significant difference on attrition between the two groups at 12 months (29% vs. 46%).

3. Results

Author, Year, Study Design	Description	Main findings
Sinyor et al., 2020[55], RCT	A brief CBT (BCBT) versus an attentional control treatment. BCBT aimed to strengthen emotion regulation and cognitive flexibility, which are mechanisms that are proposed to contribute to recovery in high-risk patients. Patients in this study were 24 youths aged between 16 and 24 years. 71% were female. Race and ethnicity in the sample was not reported. The participants had high levels of psychiatric comorbidities, with over 80% having a diagnosis of major depressive disorder (MDD). Twenty-four participants were randomized to BCBT Both treatments consisted of 10 weekly, 45-minute sessions over 15 weeks with three booster sessions occurring over the next 9 months. Sessions in both conditions started on the inpatient unit and continued as outpatient treatment when the patient was discharged. The sessions involved the adolescent only, and parents were not included.	During the 10-week active treatment, there was no significant difference on repeated self-harm, which included any episode of self-injury regardless of intent occurring between research visits (HR=0.56, 95% CI: 0.16 to 1.91), SI (measured by the Scale for Suicide Ideation [SSI]), or depression (measured by the Montgomery-Asberg Depression Rating Scale [MADRS], Beck Depression Inventory [BDI]), (Clinical Global Impression-Improvement Scale [CGI-I], and Clinical Global Impression-Severity Scale [CGI-S]). Three subjects, all in the control condition, attempted suicide during the study (5 attempts total). There was no significant difference on withdrawals from the study between control and intervention (HR=1.52, 95% CI: 0.48 to 4.81).
Esposito-Smythers et al., 2019[62,] RCT	Family-focused CBT (F-CBT) versus enhanced treatment as usual (E-TAU) in 147 adolescents with depression (mean age: 14.9 years; 76.2% were female, 85.5% were White, 9.7% were multiracial) who were hospitalized for SI or SA and who had a co-occurring risk factor, such as prior suicidal behavior, nonsuicidal self-injury (NSSI), or substance-use disorder. F-CBT included individual sessions for both the child and for the parent and focused on CBT skills and motivational enhancement and included family sessions that were offered over a 12-month period. The E-TAU condition consisted of standard outpatient care that was enhanced by two followup contacts by the study team to check on progress and whether the team could help problem solve any issues.	Rates of SAs decreased across both treatment arms over 18 months with no significant differences between the groups (Columbia-Suicide Severity Rating Scale [C-SSRS] Lethality/Medical Damage Scale, odds ratio [OR]=1.42, 95% CI: -1.23 to 4.06). At 18 months, F-CBT reported significantly higher depressive symptoms (measured by the Children's Depression Inventory-2 [CDI-2], mean difference=4.80, 95% CI: 0.64 to 8.96). There was no significant difference on major depression diagnosis (measured by the Kiddie Schedule for Affective Disorders and Schizophrenia [K-SADS], mean difference=0.23, 95% CI: -1.82 to 2.28), SI (SIQ-JR, mean difference=3.26, 95% CI: -3.96 to 10.48), NSSI (measured by the Self-Injurious Thoughts and Behaviors Interview [SITBI], mean difference=1.09, 95% CI: -2.66 to 4.84) and withdrawals from the study.

3. Results

Author, Year, Study Design	Description	Main findings
Esposito-Smythers et al., 2011[85], RCT	Integrated Outpatient CBT (I-CBT) or E-TAU. 40 adolescents (mean age=15.7; 66.7% were female, 88.9% were White) who attempted suicide within the 3 months prior to study launch or who had scored > 4 on the SIQ-JR and had an alcohol- or cannabis-use disorder to I-CBT was grounded in social learning theory and focuses on behavior change and cognitive information processing to facilitate skill acquisition. I-CBT in this study included outpatient individual, family, and parent training sessions. In addition to CBT skills, motivational interviewing was integrated into the adolescent treatment protocol. Adolescent sessions were weekly over the course of 6 months, biweekly over the next 3 months, and then monthly over the last 3 months. The E-TAU treatment was determined by the community treatment providers but enhanced with a diagnostic evaluation report and medication management through the study psychiatrist. There was also a study contact number that could be used to obtain additional resources.	At 18-month followup, I-CBT was associated with significantly fewer SAs (5.3% vs. 35.3%), emergency department visits (15.8% vs. 52.9%), psychiatric hospitalizations (15.8% vs. 52.9%) and parent-reported depressive symptoms (Behavior Assessment System for Children [BASC], d=-0.51) than E-TAU. There was no significant difference on SI (measured by the SIQ-JR), self-reported impairment measured by the (Columbia Impairment Scale [CIS]), anxiety (measured by the BASC and Screen for Child Anxiety Related Emotional Disorders [SCARED]), conduct problems (measured by the BASC), and number of withdrawals from the study.
Slesnick et al., 2020[43, 56, 97, 98], RCT	Cognitive Therapy for Suicide Prevention (CTSP) among 150 youths experiencing homelessness who were aged between 18 and 24 years. The youths had a score >16 on the Scale for Suicide Ideation-Worst Point (SSI-W) and were randomized to CTSP+ TAU or TAU only. 40.7% of the participants were female, 38.0% were African American, and 39.3% were non-Hispanic White. The CTSP intervention comprised ten 50-minute sessions involving cognitive restructuring and behavioral techniques with a focus on strengthening the participants' social networks. TAU consisted of services to meet basic needs, access to community resources, including offsite psychological services and onsite licensed therapists.	Over the 9-month followup period, there was no significant difference in SI measured by SSI-W, Beck Hopelessness Scale (BHS), cognitive distortions by the Inventory of Cognitive Distortions (ICD), or loss to followup. CTSP was found to be significantly associated with lower SIs among patients with high family network satisfaction, which was measured by Social Network Interview. Higher illicit drug use at baseline was associated with a slower reduction in cognitive distortions and SI in the TAU group but not in the CTSP+TAU group, suggesting CTSP can reduce the risk of illicit drug use. Participants who used substances at baseline and who were non-Hispanic White were more likely to maintain elevated subclinical levels of SI.

3. Results

Author, Year, Study Design	Description	Main findings
Donaldson et al., 2005[91], RCT	Skills-Based Treatment (SBT) compared with Supportive-Relationship Treatment (SRT). SBT is a skills-based CBT treatment to improve problem-solving and affect management skills, while SRT is centered on discussing mood and behavior without skill training. Both conditions involved six individual sessions and one family session over 3 months in addition to three individual sessions over the following 3 months. Participants consisted of 39 adolescents (aged between 12 and 17 years; 82% were female) who were predominantly White (85%), followed by Hispanic (10%) and African American (5%).	At 12 months, the SBT group showed a mean score of 24.89 (standard deviation [SD]=28.52) on the Suicide Ideation Questionnaire (SIQ) compared with the Supportive-Relationship group who had a mean score of 33.33 (SD: 30.42), suggesting a trend towards lower, but not statistically significant, SI in the SBT group. At the end of active treatment, as well as at 3- and 9-month followup, there was no significant difference in SAs, hospitalizations due to suicidal behaviors, SI measured by SIQ, or depression measured by Center for Epidemiological Studies-Depression (CES-D) scale. Eight patients (6 in SBT and 2 in SRT) withdrew from the study.
Asarnow et al., 2017[72], RCT	Safe Alternatives for Teens and Youths (SAFETY), a safety planning intervention with components of CBT and DBT to promote safety. The study randomized 42 adolescents (aged between 12 and 18 years) to SAFETY or E-TAU, which included parent education and connection to community supports. 88.1% of the participants were female, 21.5% were lesbian, gay, or bisexual orientation, 83.3% were White, 4.8% were African American, and 21.4% were Hispanic. Patients were assessed at baseline and 3 months and were then followed through 6 to 12 months after baseline.	Patients in the SAFETY group reported significantly fewer SAs at 3 month/posttreatment (0% vs. 18.2%) and 1 year of followup. At 3 months, there was no significant difference on NSSI (mean 0.55 vs. mean 0.43), ED visits, and hospitalization between the two groups. The SAFETY group reported significantly fewer adolescents who were lost to followup.
Spirito et al., 2015[79], RCT	Feasibility, acceptability, and preliminary efficacy of parent-adolescent CBT (PA-CBT) versus adolescent-only CBT (AO-CBT) for 24 adolescents aged between 11 and 17 years who had symptoms of depression and past or current suicidality. The participants were predominantly female (83.3%). In PA-CBT, both parents and adolescents had their own individual sessions, as well as conjoint family sessions. Adolescents in the AO-CBT group primarily received individual sessions with parents participating in end of session check-ins. Both treatments included CBT principles and framework and involved outpatient weekly sessions over 12 weeks with maintenance sessions thereafter.	During treatment and 48-week followup, SI (measured by the Beck Scale for Suicidal Ideation [BSS]) improved in both groups with no significant differences between the groups. There was no significant difference on adolescents' depressive symptoms (measured by the BDI) between the groups.

3. Results

Author, Year, Study Design	Description	Main findings
Vitiello et al., 2009[87, 89], Comparative Observational Study	Comparison of 6 months of antidepressant medication only, CBT focused on suicide prevention (CBT-SP), or their combination in 124 adolescents (aged between 12 and 18 years) who had depression and a recent history of a SA (within the prior 90 days). CBT-SP comprised up to 22 sessions including both individual and parent-youth sessions, CBT strategies and safety planning, chain analysis around the prior SA. Medication management followed the Texas Medication Algorithm for adolescent depression. The study started as a randomized trial but after low enrollment, the design was changed so families could accept randomization or chose which treatment to receive. Participants were eligible if they had a SA in the last 90 days. Of the 124 adolescents (mean age 15.7 years, 77.4% were female, 79.8% were White), 93 (75%) received the combination treatment; 17 (14%) received CBT only; and 14 (11%) received medication only.	There was a significant decline in depressive symptoms (measured by the Children's Depression Rating Scale-Revised [CDRS-R]) in all three groups. The combination treatment group reported significant improvement in functioning (the Children's Global Assessment Scale [CGAS], the Social Adjustment Scale) and depressive symptoms measured by BDI and MADRS. 12.9% of participants had a SA by Weeks 12, and 15.1% had an SA by Week 24. 29% of the patients in the combination treatment group withdrew by Week 24, compared with 38.7% patients who withdrew in the other two groups. One patient in the combination treatment group died by suicide. A significantly higher number of patients withdrew in the medication-only group than the other two groups.
Zullo et al., 2021[50], Comparative Observational Study	A group of 123 adolescent patients (aged between 12 and 18 years) underwent an intervention called Suicide Prevention and Resilience, which is based on the Interpersonal Psychological Theory of Suicide, and targets cognitions that are related to SAs, such as burdensomeness and thwarted belongingness. The treatment was delivered in the context of an intensive outpatient program (IOP) and emphasized increasing supportive interactions and was modeled after CBT for suicide prevention with components of DBT. In addition, patients in the intervention group received additional treatment sessions, which focused on increasing supportive interactions with the environment (primarily parents) and addressed cognitive distortions that may be present around key relationships. The control arm consisted of standard IOP care. Patients were eligible for the study if they had a SA or worsening of SI that warranted emergency services. Treatment was mostly in a group format over a 4-to-6-week period. Of the 123 patients, 73.2% were female, 75.6% were non-Hispanic White.	At the end of treatment, there was no significant difference on suicide risk (based on 3 items from Concise Health Risk Tracking Scale Self-Report) (d=0.20) and perceived burdensomeness (measured by the Interpersonal Needs Questionnaire [INQ]) (d=0.26). However, the intervention group reported significantly lower levels of thwarted belongingness (measured by the INQ) than the control group (d=0.40). At 1-month followup, there was no significant difference in suicide risk (d=0.26), perceived burdensomeness (d=0.05), and thwarted belongingness (d=0.21).

3. Results

Author, Year, Study Design	Description	Main findings
Kennard et al., 2019[66], Before-After Studies	This study examined clinical outcomes of an intensive outpatient treatment program on suicidal behavior in 364 adolescents (aged 12 to18 years; 79.9% were female; 86.3% were White, 7.1% were African American) with a recent SA or worsening SI. The IOP included 3 hours of group therapy, twice weekly for 4 to 6 weeks. The program also included individual and family therapy, as well as medication management as needed, and a one-hour parent psychoeducation skills group. Group sessions included CBT and DBT skills.	At the end of treatment, there was a significant improvement in parent and child-reported depression (measured by the Quick Inventory of Depressive Symptomology – Adolescent [QIDS-A]). At 6-month posttreatment, 8.7% and 27.3% of the patients reported a SA and suicide event (SA, emergency room visit for SI, or inpatient hospitalization/higher level of care) respectively, with 48% of the attempts occurring in the first month postdischarge. 81.0% of the patients completed the program (at least 5 sessions and displaying readiness for a lower-level care). Compared with those who did not complete the program, those who completed the program had significantly lower predicted odds of a suicidal event at 1-month (OR=0.22, 95% CI: 0.11 to 0.47) and 6-month (OR=0.55, 95% CI: 0.28 to 1.10) posttreatment.
Duarte-Velez et al., 2016[75], Before-After Studies	A study pilot tested Socio-CBT in 11 Puerto Rican adolescents (45.5% were female). 3 patients (27.3%) withdrew without completing the program.	At the end of treatment, 2 out of 8 patients reported clinically significant reduction on SI (measured by the SIQ-JR) from high levels at baseline and 6 patients remained low levels. All patients reported partial or total remission of at least one diagnosis of psychiatric symptoms. No patients reported ED visits

Abbreviations: AO-CBT = Adolescent-Only Cognitive Behavioral Therapy; BASC = Behavior Assessment System for Children; BCBT = Brief Cognitive Behavioral Therapy; BDI = Beck Depression Inventory; BHS = Beck Hopelessness Scale; BSS = Beck Scale for Suicidal Ideation; CBCL = Child Behavior Checklist; CBT = cognitive behavioral therapy; CBT-SP = Cognitive Behavioral Therapy Focused on Suicide Prevention; CDI = Children's Depression Inventory; CDI-2 = Children's Depression Inventory-2; CDRS-R = Children's Depression Rating Scale-Revised; CES-D = Center for Epidemiological Studies-Depression; CGAS = Children's Global Assessment Scale; CGI-S = Clinical Global Impression-Severity Scale; CI = confidence interval; C-SSRS = Columbia-Suicide Severity Rating Scale; CTSP = Cognitive Therapy for Suicide Prevention; DBT = dialectical behavior therapy; ED = emergency department; E-TAU = Enhanced Treatment As Usual; F-CBT = Family-focused Cognitive Behavioral Therapy; I-CBT = Integrated Outpatient Cognitive Behavioral Therapy; ICD = Inventory of Cognitive Distortions; INQ = Interpersonal Needs Questionnaire; IOP = intensive outpatient program; K-SADS = Kiddie Schedule for Affective Disorders and Schizophrenia; MADRS = Montgomery-Asberg Depression Rating Scale; MDD = Major Depressive Disorder; OR = odds ratio; PA-CBT = Parent-Adolescent Cognitive Behavioral Therapy; QIDS-A = Quick Inventory of Depressive Symptomology – Adolescent; RCT= randomized clinical trial; SA = suicide attempt; SAFETY = Safe Alternatives for Teens and Youths; SBT = Skills-Based Treatment; SCARED = Screen for Child Anxiety Related Emotional Disorders; SD = Standard Deviation; SI = suicidal ideation; SIQ = Suicidal Ideation Questionnaire; SIQ-JR = Suicidal Ideation Questionnaire-Junior; SITBI = Self-Injurious Thoughts and Behaviors Interview; Socio-CBT = Socio-Cognitive Behavior Therapy; SSI = Scale for Suicide Ideation; SRT = Supportive-Relationship Treatment; SSI-W = Scale for Suicide Ideation-Worst Point; TAU = treatment as usual; YSR = Youth Self-Report

As a whole, these studies suggest uncertain efficacy of CBT interventions in reducing SAs and SI across a high-risk, difficult to treat, group of adolescents, mostly those with a past history of SAs or self-harm, and those recruited from inpatient hospital programs. Most studies examined adolescents with psychiatric comorbidities, such as mood disorders, or other risks for suicide, such as substance abuse or homelessness. Participants were predominantly White, non-Hispanic, and female, suggesting these results may not generalize to male-identifying participants and minority groups. However, two of the 11 studies specifically targeted Hispanic participants with interventions that were designed to be culturally tailored for this population. Most studies compared CBT to treatment as usual, which in practice may have also incorporated

CBT principles and strategies. As such, these interventions may not have been radically different and consequently similarly beneficial in decreasing suicidal outcomes, hence, reducing the effect of CBT. Participants in both treatment arms appeared to withdraw from the studies or were lost to followup at high rates. Treatments were intensive, most involving weekly CBT for 3 to 6 months, and most involved parents. Followup periods ranged from 6 to 48 months, most long enough to examine suicidal events. Only one trial showed favorable results over TAU groups for suicide outcomes.[85] Specifically, in a small trial of 40 adolescents with suicidality and substance-abuse disorder,[85] Esposito-Smythers found Integrated Outpatient Cognitive Behavioral Therapy (I-CBT) was superior to TAU in reducing SA, ED visits, and psychiatric hospitalizations but not SI.

3.2.2.1.2. Dialectical Behavior Therapy

DBT is a third-wave cognitive behavioral treatment that was originally designed for chronically suicidal adults and has been adapted for adolescents and young adults. Third-wave CBT refers to a newer generation of psychotherapy approaches that represent an evolution of traditional CBT approaches that focus on mindfulness, acceptance, and values over cognitive restructuring. DBT is a highly structured, intensive, multi-component program consisting of weekly group and individual therapy, as well as family skills groups, telephone coaching, and weekly team consultation. DBT involves therapeutic techniques and skills to target deficits in emotion regulation, interpersonal, behavioral, and cognitive deficits. DBT includes four main skill domains (i.e., mindfulness, distress tolerance, emotion regulation, and interpersonal effectiveness) taught to address suicidal behaviors.

A total of 11 original studies reported in 16 articles with 1,581 patients were included. Of these, two studies were RCTs,[14, 81] five were comparative observational studies,[57, 92, 95, 104, 105] and five were before-after studies.[38, 45, 46, 58, 76] The median age of the patients was 15.84 years (range: 14–20.85 years); 86.97% were female. 48.50% of the patients were White, 16.48% were African American, and 17.29% were Hispanic. 56.35% of the patients reported previous SAs. Eight studies were conducted in the United States, and three were conducted in Canada. The median followup was 10 months, ranging from 1 to 29 months. Three studies were published before the year 2010. Five studies were conducted in clinic settings, two were conducted in inpatient settings, one was conducted in a residential care setting, and three were conducted in multiple settings (e.g., clinic and telehealth settings). The descriptions and main findings of the individual studies are listed in Table 6. Appendix Table D.2 lists study characteristics. Details of the interventions used in each study can be found in Appendix Table E.2.

Overall risk of bias for the RCTs was moderate due to moderate risk from deviations from the intended interventions (Appendix Table F.2.1). All comparative observational studies and before-after studies were rated as high risk of bias (Appendix Table F.2.2 and F.2.3).

3. Results

Table 6. Description and main findings of individual studies for dialectical behavior therapy

Author, Year, Study Design	Description	Main findings
McCauley et al., 2018[14], RCT	A comparison of DBT with individual and group supportive therapy (IGST). DBT involved 6 months of weekly individual and group therapy, family skills group, parent telephone coaching, and therapist team consultation. The patients were considered to have withdrawn from treatment if they missed four consecutive sessions. However, those who withdrew from treatment were included in the intention to treat sample. The treatments were 6 months in duration with a 6-month followup period. This four-site study enrolled 173 adolescents aged between 12 and 18 years with a mean age of 14.89 years. The majority of the patients were female (94.8%). Slightly over half were White (56.4%), 27.5% were Hispanic, 7.0% were African American, and 5.9% were Asian.	At the end of the 6-month treatment, patients treated with DBT had significantly fewer SAs (OR= 0.30; 95% CI, 0.10 to 0.91), NSSI (OR= 0.32; 95% CI, 0.13 to 0.70), overall self-harm (OR= 0.33; 95% CI, 0.14 to 0.78), and SI measured by SIQ-JR. However, over time, the benefits of DBT decreased with no statistically significant differences on any of the outcomes between DBT and IGST at 6 to 12 months. Significantly higher treatment completion (defined as ≥24 individual sessions) was found in the DBT group. Patients treated with DBT had significantly greater improvement in emotion regulation during the 6-month treatment and the 6-month followup period.[51] DBT was also superior with respect to remission of self-harm, substance use, and externalizing behaviors. In a subsequent study, Berk et al.,[42] used a latent class analysis to examine trajectories of treatment response. The patients treated with DBT were significantly more likely to have improvements from self-harm behaviors (SAs and NSSI). White adolescents with externalizing symptoms and higher baseline self-harm and SI were significantly less likely to respond to treatment. Another study evaluated predictors and moderators of recuring self-harm.[61] Patients with higher family conflict, more extensive self-harm histories, more externalizing problems, and no borderline personality disorder were found to have significantly lower frequency of self-harm episodes at posttreatment. In patients with higher baseline emotional dysregulation, patients who were Hispanic adolescents, and patients whose parents reported greater psychopathology and emotional dysregulation, DBT was associated with significantly greater improvement in self-harm compared with IGST. Patients with high baseline sleep disturbance, measured by the Pittsburgh Sleep Quality Index (PSQI) were associated with significantly higher self-harm (SAs and NSSI).[53]

3. Results

Author, Year, Study Design	Description	Main findings
Pistorello et al., 2012[81], RCT	An RCT by compared DBT to an optimized treatment as usual (O-TAU) in 63 college students aged between 18 and 25 years. Of the sample, 81% of the students were female, 31.7% were LGBTQ+, and 69.8% were White. The DBT intervention involved 7 to 12 months of weekly individual and group therapy, family skills group, telephone coaching, and therapist team consultation. There were 4 modifications to standard DBT. The number of distress tolerance sessions were shortened to 3 weeks and combined with 3 weeks on validation skills. Participants were allowed to miss 4 sessions; the groups ran for 1.5 hours to accommodate class schedules and the 8-week modules followed the campus schedule. The O-TAU group participants were matched for individual and family sessions but followed a non-CBT protocol based on object relations theory. Pretreatment, 3-month, 6-month, 9-month, 12-month, and 18-month assessments were collected.	The group receiving DBT had statistically significant improvements in SI (measured by Suicide Behavior Questionnaire-23 [SBQ-23]) (at the end of treatment: d=0.53, 95% CI: 0.02 to 1.03; and at the end of followup: d=0.63, 95% CI: 0.12 to 1.13), depressive symptoms (measured by the Beck Depression Inventory-Second Edition [BDI-II]) (d=0.76, 95% CI: 0.24 to 1.26), and social adjustment (measured by Social Adjustment Scale – Self-report [SAS-SR]) (d=0.69, 95% CI: 0.15 to 1.16), compared with O-TAU. The group treated with DBT had less psychotropic medication use than O-TAU. DBT was also reported with significantly fewer number of nonsuicidal self-harm events (p=0.04). SAs were too low to conduct group comparisons. Moderation analyses found that DBT was more effective for participants who scored lower on the Global Assessment of Functioning Score at baseline.
Swart et al., 2014[104], Comparative Observational Study	Mode Deactivation Therapy (MDT) was evaluated against TAU in 40 adolescents aged between 15 and 17 years. MDT is a “third wave” CBT that includes mindfulness, acceptance, emotional and cognitive defusion, along with values clarification to adopt functional alternative beliefs that can replace dysfunctional cognitions that drive maladaptive behavior. Treatment lasted between 8 and 11 months with weekly outpatient treatment. The TAU protocol was based on weekly CBT treatment. The study population was characterized by a significant representation of African American participants (60% in MDT and 65% in TAU), with the remainder of the population being White although a minority were of Hispanic origin. This diverse group was divided equally between the interventions, with each subgroup presenting with various comorbid conditions, including conduct disorder, oppositional defiant disorder (ODD), anxiety, and posttraumatic stress disorder (PTSD).	At the end of treatments, the MDT group experienced a 77% improvement in SI, measured by SIQ-HS (Suicidal Ideation Questionnaire-High School version) scores and an 88% improvement in depression measured by BDI-II (Beck Depression Inventory-II) scores. These improvements contrast sharply with the TAU group, which showed 35% and 39% improvements in SIQ-HS and BDI-II scores, respectively. The difference between the two groups were statistically significant. Furthermore, the MDT group had only two incidents of SA compared with 29 in the TAU group, indicating a substantial reduction in suicidal behavior. The MDT group also reported significant more improvements in behavior measured by CBCL, and anger by State-Trait Anger Expression Inventory (STAXI-2) scales.

3. Results

Author, Year, Study Design	Description	Main findings
Rathus et al., 2002[95], Comparative Observational Study	A comparison of 12 weeks of DBT with 12 weeks of TAU (i.e., support psychodynamic psychotherapy and family therapy) in 111 adolescents in an outpatient Adolescent Depression and Suicide Program. Eligible adolescents had previous SAs and had diagnoses or features of borderline personality disorder. The program was considerably adapted by decreasing the length to 12 weeks along with the number of skills taught. Parents attended skills group. TAU involved twice weekly individual and family sessions following psychodynamic and supportive approaches over 12 weeks. The mean age of the patients was 15.3 years, 78.2% were female, 67.6% were Hispanic, and 17.1% were African American.	At posttreatment, patients treated with DBT had significantly fewer psychiatric hospitalizations (p=0.04) and greater adherence to treatment compared with patients in the TAU group (p=0.04). There was no significant difference in SAs (1 patient in DBT vs. 7 patients in TAU).
Katz et al., 2004[92], Comparative Observational Study	A comparison of DBT with TAU in 62 adolescents (83.9% were females and 72.6% were White) aged between 14 and 17 years in two general child and adolescent psychiatric inpatient units. The DBT intervention consisted of 10 daily skills training sessions and four individual DBT sessions over 2 weeks. TAU consisted of a daily psychodynamic psychotherapy group and at least 2 psychodynamic individual therapy session over the 2-week hospitalization.	Before discharge and at 1-year followup, there was no significant difference between the two groups on SI (measured by SIQ), depression (measured by BDI), and hopelessness (measured by Kazdin Hopelessness Scale [KHS]). At 1-year followup, no patient was reported to have died by suicide. There was no significant difference on ED visits or readmission.
Tebbett-Mock et al., 2020[57], Comparative Observational Study	performed a comparative observational study of adolescents aged between 12 and 18 years to compare DBT (DBT Group 1) during approximately 1 week of hospitalization (n=425) with a historical TAU control group (n= 376). In DBT Group 1, 66.3% of participants were female, 40.9% were White, 19.8% were African American, and 9.9% were Asian; while in the TAU group 62.7% were female, 52.7% were White, 22.1% were African American, and 8% were Asian.	Participants in DBT Group 1 had a significant shorter length of stay (8.36 days vs. 10.74 days), lower incidence of SAs (0 vs. 0.02), and lower incidence of self-injury (0.04 vs. 0.09), compared with the TAU group. There was no significant difference on hospital readmissions at 30 days postdischarge (0.07 vs. 0.09). In a subsequent study,[40] the authors added a second DBT group (DBT Group 2). Participants in the DBT group 2 were similar in terms of baseline characteristics (62.8% were female, 38.7% were White) to DBT Group 1. Patients in DBT Group 2 were treated 1 year after DBT Group 1, but in this study, there were challenges including staff turnover and quality training. There were no statistically significant differences in days of hospitalization between DBT Groups 1 and 2. However, compared with DBT Group 1 and TAU, DBT Group 2 had a significantly greater frequency of SAs (0.01 vs. 0 vs. 0.02), and self-injurious behavior (0.42 vs. 0.04 vs. 0.09), respectively. The results underscore the challenges related to implementation and sustainability of quality DBT treatment programs.

3. Results

Author, Year, Study Design	Description	Main findings
Sunseri et al., 2004[105], Comparative Observational Study	A comparison of DBT with a historical control among 68 female adolescents aged between 12 and 18 years in a residential treatment setting. The authors provided no details on patient or treatment characteristics.	DBT was associated with significantly fewer days in psychiatric hospitals due to SAs (mean 0.35 days vs. 1.1 days), compared with the historical control.
Darrow et al., 2022[45], Before-After Study	Adapted family-based DBT for adolescents (DBT-A) for adolescents aged between 13 and 17 years (n= 87) and young adults aged between 18 and 26 years (n=45). DBT-A consisted of weekly individual therapy, weekly multifamily skills training, family therapy as needed, and skills coaching as needed over a 6-to-12-month period. The majority of the participants were female (77.3%), White (63.6%), and heterosexual (63.6%). 9.1% of participants were African American, and 8.3% were Asian.	Depressive symptoms severity (measured by BDI-II) and SI (measured by SIQ) decreased significantly in both groups over 6 months. There was no significant difference on depression (mean: 8.2 vs. 7.2), SI (mean 21.8 vs. mean 11.9), SAs (25.4% vs. 20%), hospitalizations (27.6% vs. 17.8%), and ED visits (24.1% vs. 28.9%) between teens and young adults. Forty patients (30.3%) withdrew from the study. The effect sizes of this study were noted to be smaller than prior efficacy studies.
Berk et al., 2020[58], Before-After Study	Feasibility and clinical effects of standard DBT-A for adolescents with self-injurious behaviors, suicidal thoughts, and suicidal behaviors treated in a community practice. This study enrolled 24 adolescents aged between 12 and 17 years with a recent history of suicidal or self-harm behaviors. Subjects were predominately female (92%) and Hispanic (63%).	Immediately after treatment, the patients had statistically significant improvements in multiple outcomes including SAs (18% vs. 45% in the past 6 months), NSSI (73% vs. 92% in the past 6 months), SI (as measured by SIQ-JR) (mean 22.71 vs. mean 44.38), and depression (as measured by BDI-youth) (mean 17.19 vs. mean 32.29), compared with the baseline. Emotional dysregulation, irritability, substance use, and family communication measures also had statistically significant improvements. One patient withdrew from the study, and one patient was lost to followup. There was no significant difference on number of ED visits and number of hospitalizations.
Courtney et al., 2015[76], Before-After Study	An adaptation of DBT for adolescents (A-DBT-A) enrolled 61 adolescents aged between 15 and 18 years (93.4% were female). A-DBT-A involved 15 weekly group sessions (adolescents attended 14 sessions and parents attended one session without their youth). Adolescents also attended weekly individual sessions over 14 weeks. The treatment did not include multifamily sessions, but parents joined 4 of the weekly skills groups. Adolescents could use telephone coaching during business hours.	Immediately at the end of treatment, there was a significant reduction in SI (as measured by SIQ) (d=0.89), self-harm (38.1% vs. 85.7% in the past 4 months), as well as the total score of Life Problems Inventory (LPI) and subscales of the confusion, emotional dysregulation, and impulsivity. Of the 61 adolescents, 23 (37.7%) completed treatments, and 31 (51%) participants completed posttreatment assessments. Impulsivity ($p<0.05$) and substance use ($p<0.05$) were predictive of treatment attrition.
Cloutier et al., 2022[46], Before-After Study	A group intervention called Building Resilience and Attachment in Vulnerable Adolescents (BRAVA) in Eastern Ontario, Canada. The study enrolled 46 adolescents aged between 13 and 17 years within 2 weeks of presenting to an outpatient clinic or ED with SI. The participants were predominantly female (91.3%). 47.8% of the participants were White, and 21.7% were multiracial. The BRAVA is a brief intervention informed by both DBT and attachment based family treatment (ABFT) and consisted of six 90-minute group sessions and six 90-minute sessions for caregivers. Adolescents and parents attended their own skills groups.	At the end of treatment, there was a significant decrease on SI (measured by SIQ-JR) (d=0.82), depression (measured by CDI-2) (d=0.70), anxiety (as measured by the Multidimensional Anxiety Scale for Children [MASC]) (d=0.54), perceived stress (as measured by the Perceived Stress Scale [PSS]) (d=1.10).

Abbreviations: ABFT = Attachment-Based Family Therapy; A-DBT-A = Adaptation of Dialectical Behavior Therapy for Adolescents; BDI-II = Beck Depression Inventory – Second Edition; BDI-youth = Beck Depression Inventory-youth; BRAVA = Building Resilience and Attachment in Vulnerable Adolescents; CBCL = Child Behavior Checklist; CBT = cognitive behavioral therapy; CDI-2 = Children's Depression Inventory-2; CI= confidence interval; DBT = dialectical behavior therapy; ED = emergency department; IGST = Individual and Group Supportive Therapy; KHS = Kazdin Hopelessness Scale; LGBTQ+ = Lesbian, Gay, Bisexual, Transgender, Questioning, or Queer; LPI = Life Problems Inventory; MASC = Multidimensional Anxiety Scale for Children; MDT = Mode Deactivation Therapy; NSSI = nonsuicidal self-injury; ODD = Oppositional Defiant Disorder; OR = odds ratio; O-TAU = Optimized Treatment as Usual; PSQI = Pittsburgh Sleep Quality Index; PSS = Perceived Stress Scale; PTSD = Posttraumatic Stress Disorder; RCT = randomized clinical trial; SA = suicide attempt; SAS-SR = Social Adjustment Scale – Self-report; SBQ-23 = Suicide Behavior Questionnaire-23; SI = suicidal ideation; SIQ-HS = Suicidal Ideation Questionnaire-High School; SIQ-JR = Suicidal Ideation Questionnaire-Junior; STAXI-2 = State-Trait Anger Expression Inventory TAU = treatment as usual

In summary, studies of DBT for the treatment of adolescents and young adults with suicidal behaviors, suicidal thoughts, and NSSI behaviors have substantial limitations. There is considerable heterogeneity among the studies with respect to the samples, setting, intervention, structure of treatment, duration of treatment, intensity of treatment, study design, outcome measures, and the family component. Most of the studies examined a substantially shortened and modified version of DBT instead of its original design as a 12 month treatment involving multiple components including skills training groups, individual psychotherapy, telephone consultation and therapist consultation team. In most studies, DBT was shortened to accommodate adolescents schedules or for short-term settings such as inpatient psychiatric hospitalizations or residential units. Only two studies[14, 81] examined DBT as it was originally designed for youths (DBT-A; Rathus & Miller, 2002).[95] These trials compared DBT-A to a well-designed comparison treatment matched for contact hours and found significant improvements in suicide outcomes. Many studies have focused on female patients treated in an outpatient setting, but the participants tended to be diverse with regard to race/ethnicity.. Most of the existing findings related to DBT are difficult to interpret as there were only two RCTs, and the remainder were before-after studies or observational studies without adequate control groups. Future studies should focus on DBT interventions of adolescents who are sex and gender minorities as well as male adolescents, adolescents from diverse socioeconomic backgrounds, and DBT treatments delivered in primary care settings.

3.2.2.1.3. Attachment-Based Family Therapy

ABFT is a manualized family therapy designed to address family processes, such as family problem solving, affect regulation, and organization of family relationships to buffer the adolescent against suicidal thinking and behaviors.

A total of four original studies reported in seven articles with 215 patients were included. Two studies were RCTs,[64, 86] and two were before-after studies.[44, 83] The median age of the patients was 15.84 years (range: 14.87–18.2 years); 81.9% were female. 32.86% of the patients were White, 48.48% were African American, and 15.5% were Hispanic. 57.87% of the patients reported previous SAs. All four studies were conducted in the United States by the same research group. The median followup was 4.25 months, ranging from 3 to 6 months. All studies were published after 2010. All four studies were conducted in clinic settings. The descriptions and main findings of the individual studies are listed in Table 7. Appendix Table D.3 lists study characteristics. Details of the interventions used in each study can be found in Appendix Table E.3.

Appendix F Table F.3 lists the risk of bias by each study. The overall risk of bias for the RCTs was high due to a high risk from measurement of outcomes and missing outcome data (Appendix Table F.3.1). Both before-after studies were rated as high risk of bias due to the lack

of representativeness of the study cohort, potential alternative causes for outcomes, and inadequate length of followup (Appendix Table F.3b).

Table 7. Description and main findings of individual studies for attachment-based family therapy

Author, Year, Study Design	Description	Main findings
Diamond et al., 2010[82, 86], RCT	A group of 66 adolescents aged between 12 and 17 years were randomized to ABFT or Enhanced Usual Care (EUC). Adolescents who scored above 31 on the SIQ-JR and above 20 on the BDI-II were recruited from EDs and primary care offices. 74% of the patients were African American, 83% were female, and 41% came from families with annual incomes of less than $30,000. ABFT in this study included individual, parent-only and conjoint sessions. ABFT interventions consisted of weekly outpatient visits for 12 to 16 weeks. The EUC condition represented a facilitated referral to a community therapist with ongoing clinical monitoring.	Compared with EUC, adolescents in ABFT showed significantly greater rates of change on self-reported SI (measured by SIQ-JR) scores and clinician reported SI (measured by SSI) at posttreatment (measured by SIQ-JR, d=0.95 and SSI, d=0.62) and 24-week followup (measured by SIQ-JR, d=0.97 and SSI, d=0.64). Four patients (11%) made SAs in ABFT compared with seven (22%) in EUC. Patients in ABFT were significantly more likely to meet criteria for clinical recovery on SIQ-JR (≤ 13) and SSI at posttreatment and followup than those in EUC. There was no significant difference in depression (measured by BDI-II). Among patients with depression, ABFT also showed significantly more reduction in SI (measured by SIQ-JR).
Diamond et al., 2019[64], RCT	A comparison of ABFT with family-enhanced nondirective supportive therapy (FE-NST) for 16 weeks of treatment. 129 adolescents were recruited between the ages of 12 and 18 years, 82% of the participants were female; 49.6% were African American, 28.7% were White, 31.9% were lesbian/gay/bisexual/questioning, and 31.3% were below the poverty level. ABFT consisted of individual and parent sessions to help both parent and child identify ruptures in the parent-child relationship and how it fuels self-destructive behavior and to help parents enhance emotionally supportive parenting. FE-NST focused on developing a supportive relationship between the adolescent and therapist and was augmented with one conjoint parent-adolescent session for safety planning and four parent-only education sessions on suicide prevention.	From baseline to the end of treatment, there were no significant differences between groups in the rate of change in SI (as measured by SIQ-JR) or on remission from SI (SIQ-JR score <12), response (≥50% decrease in SIQ-JR), and depression (as measured by BDI-II). During the course of treatment, two adolescents in ABFT and four in FE-NST attempted suicide with no significant differences between the groups. There was no significant difference on withdrawals from the study. A secondary analysis of the RCT suggested adolescents' baseline ratings of positive family functioning predicted a faster rate of improvement in SIQ-JR scores in both treatment groups with no significant difference between the groups.[60] Adolescents who were White and came from higher income background showed a slower decline in SIQ-JR scores across treatment groups. Another analysis showed that LGBQ adolescents showed a greater rate of reduction in depressive symptoms in ABFT than LGBQ adolescents in the FE-NST treatment arm.[34] There were no differential treatment effects for SI.

3. Results

Author, Year, Study Design	Description	Main findings
Russon et al., 2022[44], Before-After Study	Feasibility, acceptability, and preliminary effectiveness of ABFT specifically adapted for sexually and gender diverse youths and integrated ABFT into LGBTQ+ services. ABFT consisted of individual, parent, conjoint sessions focused on improving parent-child attachment relationship that was adapted in structure and content (i.e., more parent sessions) to help families reconcile their beliefs with their child's sexual orientation, address adolescents' fears about disappointing or being rejected by their family, and address concerns for the child's welfare. The ABFT adapted for suicidal lesbian, gay, and bisexual adolescents (ABFT-LGB) intervention consisted of weekly outpatient visits for 12 to 16 weeks. The study enrolled 10 adolescents and young adults (mean age of 18.2 years; 50% were White and 40% were African American).	The study found statistically significant decreases in SIQ-JR scores over the course of treatment. At the end of treatment, 55% of participants no longer scored in the severe range of SI (SIQ ≤ 31), and one patient reported full clinical recovery (SIQ-JR≤ 13). There were no significant reductions in depression (as measured by BDI-II). No patients withdrew from the study.
Diamond et al., 2012[83] Before-After Study	Feasibility and preliminary efficacy of ABFT-LGB in ten adolescents between the ages of 14 and 18 years old (mean age 15.1 years; SD: 1.37; 50.0% were African American, 40.0% were White) who scored above 31 on the SIQ-JR. The majority (90%) had a history of past SAs with seven participants who had multiple past attempts.	Over the course of treatment, adolescent scores on the SIQ-JR decreased significantly indicating a decrease in SI over the course of treatment (d=2.10), as well as depressive symptoms (as measured by BDI-II) (d=0.90). There was no significant difference in attachment-related anxiety (as measured by Response to Stress Questionnaire-Anxiety [RSQ-Anxiety]) (d=0.68), and attachment avoidance (as measured by Response to Stress Questionnaire-Avoidance [RSQ-Avoidance]) (d=0.98).

Abbreviations: ABFT = Attachment-Based Family Therapy; ABFT-LGB = Attachment-Based Family Therapy Adapted for Suicidal Lesbian, Gay, and Bisexual Adolescents; BDI-II = Beck Depression Inventory – Second Edition; ED = emergency department; EUC = Enhanced Usual Care; FE-NST = Family-Enhanced Nondirective Supportive Therapy; LGBQ = Lesbian, Gay, Bisexual, Queer; RCT = randomized clinical trial; RSQ-Anxiety = Response to Stress Questionnaire-Anxiety; RSQ-Avoidance = Response to Stress Questionnaire-Avoidance; SD = standard deviation; SI = Suicidal Ideation; SIQ = Suicidal Ideation Questionnaire; SIQ-JR = Suicidal Ideation Questionnaire-Junior; SSI = Scale for Suicide Ideation

In summary, the ABFT interventions evaluated were short-term (12 to 16 weekly sessions) treatments and thus, are scalable to youths with serious suicidal thoughts presenting to community mental health and other outpatient settings, particularly compared with multi-component treatment protocols that have been studied. As a whole, the results of these studies suggest uncertain efficacy of this treatment. Although ABFT was more effective than usual care in reducing SI, it did not outperform a family therapy control treatment in reducing SAs and SI, suggesting that family support may be the active ingredient. Several modifiers of ABFT were examined including sexual trauma, therapeutic alliance, treatment alliance and therapist adherence. Sexual trauma did not moderate ABFT outcomes.[82] In terms of therapeutic alliance and treatment adherence, findings suggest when adolescents have a strong alliance with their therapist, they do better in ABFT when the therapist adhered to the treatment manual.[107]

Overall, ABFT appears feasible and acceptable to adolescents from diverse backgrounds at high risk for suicide, including racial minorities, youths from low-income families, and sexual and gender diverse individuals. The samples, however, are largely female identifying patients so less is known about the acceptability, feasibility, and preliminary outcomes associated with

male-identifying patients, a group with higher rates of deaths from suicide. Finally, all of the studies were from the same research group suggesting the need for outside replication of findings.

3.2.2.1.4. Family-Focused Therapy

Family-Focused Therapy was developed for patients with bipolar disorder and is a modification of behavioral family management therapy for patients with schizophrenia. The treatment consists of family sessions that include psychoeducation, communication skills training, and problem-solving skills training designed to reduce family expressed emotion or family criticism, hostility or overinvolvement directed towards the patient.

Only one RCT consisted of 127 patients was included.[54] The median age of the patients was 13.25 years; 64.45% were female. 18.35% of the patients were Hispanic. 15.5% of the patients reported previous SAs. The study was conducted in the United States. The median followup was 48 months. The study was conducted in a clinic setting. The descriptions and main findings of the individual studies are listed in Table 8. Appendix Table D.4 lists study characteristics. Details of the intervention used in this study can be found in Appendix Table E.4. The overall risk of bias for the RCT was high due to deviations from the intended interventions and missing outcome data (Appendix Table F.4.1).

Table 8. Description and main findings of individual studies for family focused therapy

Author, Year, Study Design	Description	Main findings
Miklowitz et al., 2020[54], RCT	A comparison of Family-Focused Therapy (FFT) with Enhanced Care (EC) in 127 adolescents aged between 9 and 17 years who met criteria for unspecified bipolar disorder or major depressive disorder with active mood symptoms who also had at least one relative with bipolar disorder. FFT consisted of twelve 60-minute sessions and focused on psychoeducation about managing mood disorders, communication enhancement training, and problem-solving skills training. EC included three weekly, 60-minute, family psychoeducation sessions followed by three monthly individual psychoeducation sessions focused on implementing a mood management plan. Adolescents in the FFT group had a mean age of 13.2 years (SD: 2.7 years), 19.7% were non-White, and 24.6% were Hispanic. In contrast, the EC group had a similar mean age of 13.3 years (SD: 2.5 years), and 15.2% were non-White, and 12.1% were Hispanic.	During the 4-year study, 16 participants (24.2%) in EC and 9 participants (13.6%) in FFT reported at least one suicidal event (defined as actual self-harm or threats of self-harm with clear suicidal intent resulting in an inpatient admission or ED visit; instances of self-harm with unclear suicidal intent; and/or increases in weekly Psychiatric Status Ratings- Suicidal Ideation subscale (PSR-SI) ratings to 5 or 6). Compared with EC, FFT was associated with significantly reduced suicidal events (HR=0.41; 95% CI: 0.12 to 0.98). Among patients with high baseline SIQ scores, and the EC group had significantly lower SIQ scores compared with the FFT group. There were no significant differences in the number of participants lost to followup between the two groups.

Abbreviations: EC = Enhanced Care; FFT = Family-Focused Therapy; PSR-SI = Psychiatric Status Ratings- Suicidal Ideation; RCT = Randomized Clinical Trial; SD = standard deviation

3.2.2.1.5. Collaborative Assessment and Management of Suicidality-Based Psychosocial Treatments

CAMS is an outpatient individual therapy approach that targets youth-defined drivers of suicidal thoughts and behaviors. CAMS is guided by the Suicide Status Form (SSF), which identifies risk and contributors to risk and assists with planning how to address those problems until suicidal thinking and behavior are resolved.

3. Results

A total of three original studies (1 RCT[52] and 2 before-after studies[35, 39]) with 273 patients were included. The median age of the patients was 16.63 years (range: 14.48–20 years); 66.2% were female. 62.60% of the patients were White, 3.62% were African American, and 11% were Hispanic. 37.56% of the patients reported previous SAs. All three studies were conducted in the United States. The median followup was 3 months, ranging from 1 to 6 months. All studies were published after the year 2010. Two studies were conducted in clinic settings, and one was conducted in multiple settings (i.e., clinic and telehealth). The descriptions and main findings of the individual studies are listed in Table 9. Appendix Table D.5 lists study characteristics. Details of the interventions used in each study can be found in Appendix Table E.5.

The RCT conducted by Pistorello et al.,[52] was judged to have moderate risk of bias in the domains of randomization process, deviations from intended interventions, and selection of the reported results (Appendix Table F.5.1). The two before-after studies were rated as high risk of bias (Appendix Table F.5.2).

Table 9. Description and main findings of individual studies for collaborative assessment and management of suicidality-based psychosocial treatments

Author, Year, Study Design	Description	Main findings
Pistorello et al., 2021[52], RCT	A comparison of CAMS with TAU among 62 suicidal college students (mean age=19.97 years; SD: 1.97 years). 67.7% of the participants were female and 48.4% were White. Patients in the CAMS group received a mean of 6.76 sessions (SD: 2.32 sessions) over 48 weeks.	There was no significant difference between CAMS and TAU on the number of patients with SI (51.7% vs. 69.6%), SSI score (mean 11.0 vs. mean 11.0), SAs (0 vs. 0), NSSI (24.1% vs. 39.1%), and withdrawal from the study (27.3% vs. 17.2%). Among students with fewer borderline personality disorder features, no SA history, and older age, CAMS had a significantly higher impact on depression, and SI and was more likely than TAU to decrease hopelessness. Conversely, TAU did better for students with bipolar disorder features and multiple SAs.
Adrian et al., 2023[35], Before-After Study	An outpatient crisis care clinic (CCC) utilizing CAMS for youths presenting with self-injurious thoughts and behaviors (SITB). The CCC intervention included up to four sessions of assessment, management, and treatment of SITB. The study included 189 patients aged between 10 and 20 years.	Of which, 62.4% were females and 70% were White. Comparing before and after treatment, the authors found a significant reduction of clinician-reported past-month SAs (48% vs. 5.8%, respectively, d=0.41) and CAMS self-reported suicide risk ratings (d=0.53). Patients reporting past-month ED visits reduced from 77% to 8% after treatment and 12% after 1-month followup; while inpatient psychiatric admissions reduced from 10% to 2% posttreatment and 8% after 1-month followup.

Author, Year, Study Design	Description	Main findings
Adrian et al., 2021[39] Before-After Study	A pilot study testing feasibility, acceptability, and appropriateness of the CAMS intervention with suicidal adolescents. Each patient received up to sixteen 60-minute sessions, with treatment length determined by CAMS clinical response criteria (i.e., three consecutive sessions of low ratings of overall risk along with management of suicidal thoughts and feelings and no suicidal behaviors). The study included 22 patients aged between 13 and 17 years, 81% were white and 59.1% were female. Adolescents received a mean of 5.22 sessions.	After treatment, 54.4% of the patients' suicidality resolved, defined as three sessions of low self-reported risk, management of suicide urges, and no self-injury. SI measured by the SIQ-JR, significantly decreased (d=0.67). Five patients (22.7%) reported NSSI, three (13.6%) had an SA, and two (9.1%) had an aborted SA. There was a significant reduction in depression severity measured by the PHQ-9 (p<0.001). During the course of treatment, patients' self-reported risk of suicide reduced significantly (p<0.001).

Abbreviations: CAMS = Collaborative Assessment and Management of Suicidality; CCC = Crisis Care Clinic; ED = Emergency Department; NSSI = Nonsuicidal Self-Injury; RCT = Randomized Clinical Trial; SA = Suicide Attempt; SD = Standard Deviation; SI = Suicidal Ideation; SITB = Self-Injurious Thoughts and Behaviors; SIQ-JR = Suicidal Ideation Questionnaire-Junior; SSI = Scale for Suicide Ideation; TAU = Treatment as Usual

In summary, CAMS is a brief, scalable outpatient treatment shown to be acceptable and feasible to adolescents with suicidality in before-after studies. However, in the only RCT conducted in youths, CAMS showed limited advantage in reducing suicidal outcomes when compared with treatment as usual.

3.2.2.2. Acute Interventions

Acute interventions consist of single-session treatments offered mostly in the context of an ED or inpatient setting with or without followup contacts, or 1 to 4 session adjunct treatments, or continuity of care interventions (e.g., telephone calls and single outpatient visits) following crisis stabilization.

3.2.2.2.1. Family-Based Crisis Management

Family-based crisis management interventions comprise interventions offered within the context of an ED visit for a suicidal crisis. They typically include psychoeducation, cognitive behavioral skill building, safety planning, and motivation enhancement to engage the youths in outpatient treatment.

A total of four original studies (2 RCTs[69, 84] and 2 comparative observational studies[80, 96]) with 710 patients were included. The median age of the patients was 15.16 years (range: 14.7–15.55 years); 79% were female. 54.78% of the patients were White, 11.88% were African American, and 38.3% were Hispanic. 48.36% of the patients reported previous SAs. All 4 studies were conducted in the United States. The median followup was 6.25 months, ranging from 1–18 months. One study was published before 2010. Two studies were conducted in an ED setting, and two were conducted in multiple settings (i.e., ED, clinic, and telehealth). The descriptions and main findings of the individual studies are listed in Table 10. Appendix Table D.6 lists study characteristics. Details of the interventions used in each study can be found in Appendix Table E.6.

Appendix Tables F.6.1 and F.6.2 list the risk of bias by each study. The overall risk of bias for the RCTs was moderate due to the moderate risk from deviations from intended interventions, while comparative observational studies were rated as high risk.

3. Results

Table 10. Description and main findings of individual studies for family-based crisis management

Author, Year, Study Design	Description	Main findings
Asarnow et al., 2011[84], RCT	The study explored ways for improving safety and followup in suicidal adolescents who presented to the ED. The study randomized 181 children and adolescents (aged between 10 and 18 years; 69% were female, 33% were White, 13% were African American, 35% were Hispanic) to a single family-based CBT session designed to improve motivation for safety and followup telephone calls following discharge, or to TAU with education.	There was no significant difference between the groups on SAs (OR=1.0, 95% CI: 0.2 to 3.8), SI (measured by Harkavy-Asnis Scale [HASS] Passive Suicidal Ideation; mean difference=1.7, 95% CI; -2.7 to 6.2), depression (measured by CES-D; mean difference=2.2, 95% CI: -2.4 to 6.8), and family functioning (measured by the Children's Behavior Questionnaire [CBQ]; mean difference=0.1, 95% CI:-1.2 to 1.3). One patient died by suicide in the study, but the study group assignment of this individual was not specified.
Wharff et al., 2019[69], RCT	A comparison of a family-based crisis intervention (FBCI) with TAU in 142 suicidal adolescents aged between 13 and 18 years. The FBCI was an emergency psychiatry intervention that helped the adolescent and family develop a joint crisis narrative and taught cognitive behavioral skill building, therapeutic readiness, psychoeducation, and safety planning. The TAU group received standard psychiatric evaluation and clinical/discharge recommendations.72% of the patients were female with mean age of 15.5 years. 66% of the patients were White, 6% were African American, and 9% were Hispanic. Patients were followed for 1 month.	The FBCI group reported significantly more improvement in family empowerment (Family Empowerment Scale; mean 2.7 vs. mean 1.0) and were less likely to be hospitalized (38% vs. 68%). There was no significant difference in suicidality (as measured by Reasons for Living Inventory for Adolescents [RFL-A]; mean 0.15 vs. mean 0.07) and study withdrawals (15% vs. 24%).
Wharff et al., 2012[80], Comparative Observational Study	The study evaluated the same FBCI in 100 adolescents (mean age=15.6 years, SD: 1.5 years; 65% were White; 76% were female) who presented to the ED during the FBCI study period. Of these participants, 44 were later excluded due to not presenting with a family member, being intoxicated or sedated at presentation, having cognitive limitations, or presenting to the ED after hours or on weekends. These patients were followed for 3 months after the ED visit and were compared with a historical control group (n=150) who had similar baseline characteristics.	Patients in the FBCI group were significantly less likely to be hospitalized immediately after ED visits than the historical control (35.0% vs. 55.3%). No patients in the FBCI group reported SAs or suicide deaths during the 3-month followup.
Rotheram-Borus et al., 2000[96], Comparative Observational Study	The study evaluated the impact of a specialized ED care intervention on 140 female adolescents with SA over 18 months. The average age of the participants was 14.9 years (SD: 1.4 years) and 87.1% were Hispanic. During their ED visit, 140 patients and their mothers were assigned to receive specialized ED care aimed at enhancing adherence to outpatient therapy by providing a "soap opera" video regarding suicidality, a family therapy session, and staff training; or to receive standard ED care. Following discharge, the adolescents received six sessions of Successful Negotiation Acting Positively (SNAP), a followup family cognitive behavioral treatment to support positive coping strategies and enhance family support for problem solving.	At 18 months, the specialized ED care was associated with significantly reduced depression symptoms (as measured by the BDI), compared with standard ED care. There was no significant difference in SI measured by Harkavy Asnis Suicide Survey. There were 6 (9.23%) patients in the specialized ED care who reported SAs, compared with 11 (14.67%) patients in standard ED care (p=0.33).

Abbreviations: BDI = Beck Depression Inventory; CBQ = Children's Behavior Questionnaire; CBT = cognitive behavioral therapy; CI = confidence interval; ED = emergency department; FBCI = Family-Based Crisis Intervention; OR = odds ratio; RCT = randomized clinical trial; RFL-A = Reasons for Living Inventory for Adolescents; SA = suicide attempt; SD = standard deviation; SNAP = Successful Negotiation Acting Positively; TAU = treatment as usual

In summary, two RCTs and two comparative observational studies compared structured crisis interventions delivered in the ED or following discharge to treatment as usual and found evidence of lower rates of psychiatric hospitalizations. Most of these interventions involved a family intervention component and patients were excluded who presented to these settings without a relative. More data is needed to examine the efficacy of crisis interventions with diverse youths and male participants. Long-term data on SAs or SI is not available.

3.2.2.2.2. Motivational Interviewing Crisis Interventions

Motivational Interviewing Crisis Interventions consisted of interventions offered within the ED that were based on the self-determination theory of self-regulation and change, designed to enhance treatment engagement and motivation for change following a suicidal crisis. Many of these treatments included case management or followup.

All 3 included studies were RCTs with a total of 267 patients.[59, 71, 78] The median age of the patients was 16.18 years (range: 15.08 to 17.7 years); 79.62% were female. 52.27% of the patients were White, 21.31% were African American, and 9.9% were Hispanic. 42.53% of the patients reported previous SAs. All three studies were conducted in the United States. The median followup was 3.6 months, ranging from 2–6 months. All the studies were published after the year 2010. One study was conducted in an inpatient setting, and two were conducted in multiple settings (i.e., ED, and telehealth). The descriptions and main findings of the individual studies are listed in Table 11. Appendix Table D.7 lists study characteristics. Details of the interventions used in each study can be found in Appendix Table E.7.

The overall risk of bias for the RCTs was moderate due to moderate risk from deviations from intended interventions (Appendix Table F.7.1).

Table 11. Description and main findings of individual studies for motivational interviewing crisis interventions

Author, Year, Study Design	Description	Main findings
Grupp-Phelan et al., 2019[59], RCT	An evaluation of a motivational interviewing-based intervention in adolescents who screened positive on a suicide screening questionnaire during a nonpsychiatric ED visit. 168 patients aged between 12 and 17 years were randomized to 1.) Suicidal Teens Accessing Treatment After an Emergency Department Visit (STAT-ED), including motivational interviewing to target family engagement, problem solving, referral assistance, and limited case management (n=84); or 2.) EUC, including brief mental healthcare consultation and referral (n=84).	At 2-month and 6-month followup, there was no significant difference in SI measured by SIQ-JR (2 months, mean difference = -0.2, 95% CI: -4.2 to 3.7; 6 months, mean difference=2.5, 95% CI: -3.3 to 8.3) and depression measured by CES-D (2 months, mean difference=-0.5; 95% CI: -4.8 to 3.7; 6 months, mean difference=1.3, 95% CI: -4.0 to 6.6). Twelve patients were lost to followup in the STAT-ED group, compared with nine patients in the EUC group.

Author, Year, Study Design	Description	Main findings
McManama et al., 2018[71], RCT	An evaluation of the effectiveness of the Alcohol and Suicide Intervention for Suicidal Teens (ASIST), an acute motivational enhancement intervention targeting alcohol use and suicidal thoughts and behaviors for suicidal adolescents receiving inpatient psychiatric treatment. The treatment included one 60-to-90-minute individual session and one 20-to-30-minute family session. The study randomized 50 patients aged between 14 and 17 years to either ASIST or TAU.	At 3-month followup, no patients in the ASIST group reported SAs, compared with two patients in the TAU group. There were no significant differences in SA, severity of SI measured by SIQ (mean 57.20 [SD: 39.47] vs. mean 51.29 [SD: 31.22], and loss to followup (20% vs. 16%) between the two groups.
King et al., 2015[78], RCT	An evaluation of the effectiveness of Teen Options for Change (TOC), a motivational interviewing intervention based on the self-determination theory of self-regulation and change, with a focus on adolescents' values, goals, and options for behavioral change. The intervention included a 35–45-minute interview with telephone check-in 2 to 5 days after the ED visit. The study randomized 49 adolescents aged between 14 and 19 years who presented to ED with SI or a recent attempt or a positive screen for depression and substance abuse to TOC or E-TAU.	At 2-month followup, there was no statistically significant difference between the two groups in SI as measured by SIQ-JR and hopelessness measured by BHS. Compared with those in TAU, patients in the TOC group reported significantly lower depression symptoms (d=1.07), measured by the Reynolds Adolescent Depression Scale, 2nd Edition: Short Form (RADS-2:SF).

Abbreviations: ASIST = Alcohol and Suicide Intervention for Suicidal Teens; BHS= Beck Hopelessness Scale; CES-D = Center for Epidemiological Studies-Depression; CI = confidence interval; ED = emergency department; E-TAU = Enhanced Treatment as Usual; EUC = enhanced usual care; n = number; RADS-2: SF = Reynolds Adolescent Depression Scale, 2nd Edition Short Form; RCT = randomized clinical trial; SI = suicidal ideation; SIQ-JR = Suicidal Ideation Questionnaire-Junior; STAT-ED = Suicidal Teens Accessing Treatment After an Emergency Department Visit; TAU = treatment as usual; TOC = Teen Options for Change

Overall, the evidence from the RCTs suggests Motivational Interviewing Crisis Interventions, which are acute interventions that aim to improve treatment engagement for suicidal adolescents, do not improve suicidal outcomes over TAU for suicidal adolescents presenting to the ED or those receiving inpatient psychiatric treatment.

3.2.2.2.3. Safety Planning

Safety planning interventions are acute, collaborative interventions offered within ED or inpatient settings designed to help youths identify warning signs for suicide along with concrete strategies, supportive contacts, and resources to mitigate future crises.

Two RCTs with 102 patients evaluated safety planning.[67, 70] The median age of the patients was 15.26 years (range: 15.1–15.42 years); 84.1% of the patients were female. 81.65% of the patients were White, 8.3% were African American, and 4.25% were Hispanic. 80.25% of the patients had previous SAs. Both studies were conducted in the United States. The median followup was 4.5 months, ranging from 3 to 6 months. All studies were published after the year 2010. Both studies were conducted in multiple settings (i.e., inpatient and telehealth). The descriptions and main findings of the individual studies are listed in Table 12. Appendix Table D.8 lists study characteristics. Details of the interventions used in each study can be found in Appendix Table E.8.

Appendix F Table F.8.1 lists the risk of bias for each study. The overall risk of bias for the RCTs was moderate to high due to moderate to high risk from deviations from intended

interventions and high risk from measurement of outcomes. The comparative observational study and before-after studies were rated as high risk of bias.

Table 12. Description and main findings of individual studies for safety planning

Author, Year, Study Design	Description	Main findings
Czyz et al., 2019[67], RCT	The trial examined a motivational interviewing-safety planning intervention (MI-SafeCope) for adolescents hospitalized for suicide risk. The study randomized 36 patients aged between 13 and 17 years to MI-SafeCope or TAU. MI-SafeCope involved using a motivational interviewing framework to guide safety planning with the adolescent and a 30-minute family session that shared the safety plan and prepared parents supporting the adolescent in implementing the plan. 78.8% of the patients were female, 86.1% were White, 8.3% were African American, 5.6% were Hispanic and 8.3% were Asian.	Compared with TAU, the MI-SafeCope group had greater increased self-efficacy to not engage in SAs (Self-Assessed Expectations of Suicide Risk Scale), to use coping relying on self, and to employ their safety plan. However, the MI-SafeCope group reported significantly higher risk of daily SI (OR=1.62). There was no significant difference on frequency and duration of SI. At 3-month followup, in the MI-SafeCope group there were four patients with nonlethal SAs, six patients were hospitalized, and seven had ED visits. One patient died by suicide. In the TAU group, four patients reported nonlethal SAs, two patients were hospitalized, and five patients had ED visits. There was no significant difference on study withdrawals between the two groups.
Kennard et al., 2018[70], RCT	The trial evaluated a safety planning intervention with emotion regulation skills intervention, As Safe as Possible (ASAP), combined with a smartphone app (BRITE) for psychiatrically hospitalized suicidal adolescents. The smartphone app provided personalized ways of regulating emotions and safety planning. The study randomized 66 adolescents aged between 12 and 18 years to ASAP and TAU or TAU alone. The patients were predominantly female (89.4%), but race/ethnicity was not reported.	At week 4, week 12, and week 24, there were no statistically significant differences in SI (as measured by SIQ-JR), SAs (as measured by C-SSRS), or ED visits. There was no significant difference in loss to followup (3.5% vs. 13.5%).

Abbreviations: ASAP = As Safe as Possible; C-SSRS = Columbia-Suicide Severity Rating Scale; ED = emergency department; OR = odds ratio; RCT = randomized clinical trial; SA = suicide attempt; SIQ-JR = Suicidal Ideation Questionnaire-Junior; TAU = treatment as usual

In summary, safety planning interventions show limited advantage over treatment as usual in reducing suicidal behavior in suicidal youths presenting to an ED or in inpatient settings.

3.2.2.2.4. Continuity of Care Following Crisis

Continuity of care interventions are those that provide telephone- or text-based, supportive contacts to enhance safety (e.g., review safety plan and means restriction) or provide interventions that also include an outpatient followup appointment within one week after discharge from the hospital along with a telephone contact.

A total of three original studies (2 RCTs,[49, 63] and one comparative observational study[94]) with 508 patients were included. The median age of the patients was 14.74 years (range: 14–15.17 years); 68.83% of the patients were female. 77.42% of the patients were White, 6.11% were African American, and 4% were Hispanic. 58.74% of the patients reported previous SAs. Two studies were conducted in the United States, and one was conducted in Canada. The median followup was 4 months, ranging from 3–6 months. One study was published before the year 2010. One study was conducted through telehealth, and two in multiple settings (i.e., clinic,

inpatient, and telehealth). The descriptions and main findings of the individual studies are listed in Table 13. Appendix Table D.9 lists study characteristics. Details of the interventions used in each study can be found in Appendix Table E.9.

Appendix Table F.9 lists the risk of bias for each study. The overall risk of bias for the RCTs was moderate to high due to moderate to high risk from deviations from intended interventions and high risk from measurement of outcomes (Appendix Table F.9.1). The comparative observational study was rated as high risk of bias (Appendix Table F.9.2).

Table 13. Description and main findings of individual studies for continuity of care following crisis

Author, Year, Study Design	Description	Main findings
Czyz et al., 2021[49], RCT	This was a two-phase trial comparing Motivational Interview Enhanced Safety Plan (MI-SP) alone with Motivational Interview Enhanced Safety Plan plus additional text support (MI-SP+text) following discharge. In Phase 1, adolescents hospitalized for suicide risk (n=80, aged between 13 and 17 years; 67.5% were female, 83.85% were White) were randomized to receive MI-SP during hospitalization and after discharge either support text messages or no support text messages. After 2 weeks, Phase 2 was initiated, and patients were randomized to receive booster telephone calls or no telephone calls, with outcomes being assessed with a daily log for four weeks and at 1- and 3-month followup.	Patients in the MI-SP+ text group were less likely, although this not statistically significant, to report SI (HR=0.30, 95% CI: 0.06 to 1.48) and rehospitalization (HR=0.77, 95% CI: 0.23 to 2.51) at 3 months after discharge than those who did not receive text messages (MI-SP group). Booster calls did not significantly reduce SAs. Study withdrawals were low and were not significantly different across the groups. In a secondary analysis of the study at 1-month followup, [37] 90.7% of 78 adolescents (2 patients were excluded from the analysis due to missing outcome), still had access to their safety plan. There was a decline in the use of the safety plan and a decline in SI (measured by a 4-point Likert scale modelled after C-SSRS) over time. Statistically significant sex-differences were noted with females' safety plan use increases showed increases in SI, whereas males' safety plan use declined over time regardless of SI changes.
Rengasamy et al., 2019[63], RCT	This trial evaluated an intervention of brief telephone calls (checked suicidality, reviewed safety plan, means restriction) following psychiatric discharge in adolescents hospitalized for SI or an SA (n=142, aged between 12 and 18 years, 70% were female, 74% were White, 22% were African American). Patients were randomized to either an intervention of either single or multiple telephone calls over a period of 90 days.	Adolescents in the multiple telephone call intervention group had a significantly lower rate of SA (6% vs. 17%) at 90 days, compared with the single telephone intervention group. There was no significant difference on number of hospital readmissions (15% vs. 19%), duration of hospital readmissions (14.0 days vs. 11.6 days), and ED/crisis encounters (11% vs. 16%). There were no deaths by suicide reported in either group.
Greenfield et al., 2002 [94], Comparative Observational Study	A group of 286 suicidal adolescents aged between 12 and 17 years (68% were female) was assigned to either a rapid-response outpatient model consisting of immediate followup care from a specialized outpatient team after assessment in the ED, or a control condition involving continuation of the treatment initiated in the ED.	Compared with the control, adolescents in the rapid-response outpatient model reported significantly reduced hospitalization related to suicidality at 2-month (17% vs. 41%) and 6-month followup (18% vs. 43%). There was no significant difference on the functional outcome measured by Children's Global Assessment Scale and suicidal behavior measured by Spectrum of Suicidal Behavior Scale.

Abbreviations: CI = confidence interval; C-SSRS = Columbia-Suicide Severity Rating Scale; ED = emergency department; HR = hazard ratio; MI-SP = Motivational Interview Enhanced Safety Plan; n= number; RCT = randomized clinical trial; SA = suicide attempt; SI = suicidal ideation

3.2.2.2.5. Brief Adjunctive Treatments

Brief adjunctive treatments were brief (1 to 4 session) interventions intended to provide youths with additional skills or support in conjunction with standard outpatient or inpatient care.

A total of six original studies (3 RCTs,[48, 101, 106] 1 comparative observational study,[41] and 2 before-after studies[68, 103]) with 992 patients evaluated brief adjunctive treatments. The median age of the patients was 15.49 years (range: 13 to 19.02 years); 66.66% of the patients were female. 66.39% of the patients were White, 19.71% were African American, and 18.12% were Hispanic. 58.47% of the patients reported previous SAs. All six studies were conducted in the United States. The median followup was 3.83 months, ranging from 1 to 6 months. Two studies were conducted through telehealth, one in a clinic setting, one in a psychiatric emergency department, and two in multiple settings (i.e., inpatient and telehealth). The descriptions and main findings of the individual studies are listed in Table 14. Appendix Table D.10 lists study characteristics. Details of the interventions used in each study can be found in Appendix Table E.10.

Appendix F Tables F.10.1, F.10.2, and F.10.3 list the risk of bias for each study. The overall risk of bias for the RCTs was moderate to high due to deviations from intended interventions. The comparative observational study and before-after studies were rated as high risk of bias.

Table 14. Description and main findings of individual studies for brief adjunctive treatments

Author, Year, Study Design	Description	Main findings
Fitzpatrick et al., 2005[101], RCT	The trial enrolled 110 patients (mean age=19.02 years; SD: 1.21 years; 54.5% were female) to compare Brief Problem-Orientation (BPOT), based on the Problem-Solving Therapy, with TAU. The BPOT intervention consisted of a 35-minute video on problem solving and coping styles. The racial makeup of the sample was predominantly White (75%), with the rest of the cohort comprising American Indian or Alaskan native (1%), Hispanic (2%), Asian/Pacific Islander (14%), African American (4%), and Other or Mixed Ancestry (3%).	At posttreatment (i.e., 1 month following baseline assessment), mean scores on the Beck Suicide Scale in the BPOT group and the TAU group were 10.40 (SD: 5.29) and 10.68 (SD: 7.59), respectively, with scores slightly decreasing by the end of the study (i.e., 2 months following baseline assessment) to 8.18 (SD: 8.44) for the BPOT group and 9.48 (SD: 8.01) for the TAU group. There were no significant differences between the groups. There were also no significant differences between the groups on the BDI or the BHS.
Dobias et al., 2021[48], RCT	Project SAVE, a 30-minute, web-based, single-session intervention that used CBT elements was compared with an active control program, a 30-min, self-administered, web-based program that uses components of supportive therapy to encourage feelings sharing. The trial enrolled 565 adolescents aged between 13 and 16 years; 75.0% were White, 21.1% were Hispanic, and 9.7% were African American. The three most commonly endorsed genders were girl/woman (66.37%), nonbinary (19.29%), and “not sure” (10.62%).	At 3-month followup, there were no differences between the groups on NSSI (d= -0.04, 95% CI: -0.20 to 0.13), and SI (d=0.11, 95% CI: -0.06 to 0.27). There were also no significant differences on the number of study withdrawals at the end of the treatment (20.98% vs. 21.51%) or at the end of 3-month followup (58.04% vs. 61.29%).

3. Results

Author, Year, Study Design	Description	Main findings
Yen et al., 2020[106], RCT	Suicide Prevention Therapeutic Engagement Program (STEP) is an adjunctive intervention designed to increase attention to positive emotions and experiences and to decrease suicidal events. The study randomized 52 adolescents aged between 12 and 18 years recruited from an adolescent psychiatric inpatient unit to the STEP group or to an E-TAU group. Patients in the STEP program had three individual and one family, in-person session delivered on the inpatient unit or shortly after discharge. The sessions were focused on mindfulness, gratitude, and savoring. Following discharge, patients in the STEP program received weekly telephone calls and daily text messages to facilitate practicing of exercises. In both groups, patients were predominantly female (61.5%), and 76.9% were White (76.9%). Over half were homosexual/gay/lesbian (51.9%). A significant portion of participants in both groups had experienced past abuse (38.5% in the STEP group vs. 73.9% in the E-TAU group).	At the end of 6-month followup, five patients (19%) in the STEP group reported a suicide event (a composite measure of SAs and emergency intervention) compared with 10 patients (38%) in the E-TAU group. Active SI (i.e., SI with either intent, method, or plan) in the week before hospitalization dropped from 80.8% to 31.8% for the worst week in the STEP group and from 69.2% to 50% in the E-TAU group. The STEP group reported significantly improved parent-reported symptoms of depression, measured by BDI (d=0.76) at the end of treatment. However, at 6-month followup, there were no significant differences in parent-reported symptoms of depression (d=0.42) or adolescent-reported symptoms of depression (d= -0.12). There were also no significant differences in loss to followup between the two groups.
Ahmadi et al., 2022[41], Comparative Observational Study	The study examined effects of using brief reminder-focused positive psychiatry and suicide prevention (RFPP-S) on youths with PTSD and increased suicide risk (C-SSRS ≥3) treated in a psychiatric ED setting. This study compared 50 youths aged between 9 and 18 years who received RFPP-S to 150 youths receiving TAU. 57.5% of the included patients were female. Patient race/ethnicity was not reported. RFPP-S consisted of exercises to improve self-compassion, treatment engagement, tolerance of reminders related to trauma, distress tolerance, and parent support. These exercises were conducted for 10 minutes, twice daily for two consecutive days. After discharge, RFPP-S groups received reminders about followup mental health visits via text or telephone calls twice weekly.	Compared with TAU, the RFPP-S group reported significantly greater reduction on suicidality, measured by C-SSRS (mean 1.0 vs. mean 1.8) and symptoms of PTSD, measured by the Clinician Administered PTSD Scale for Children (mean 16 vs. mean 29) at 6-month followup. They also showed and greater improvement on measures of well-being, resilience, flexible thinking, coping skills, and parent-child positive interactions. Compared with TAU, there were significantly fewer hospital readmissions due to suicidality at 1-month (0% vs. 20%) and 6-month followup (0% vs. 32%).
Yen et al., 2019[68], Before-After Study	Skills to Enhance Positivity (STEP) is an adjunctive treatment focused on psychoeducation on the function of positive emotions and three sets of skills (mindfulness meditation, gratitude, and savoring). The STEP intervention included an intensive in-person phase of three individual sessions and one family session, complemented by a month of daily text messaging and weekly telephone calls postdischarge to reinforce skills practice. The study recruited 20 adolescents hospitalized due to suicide risk (mean age=15.9 years; SD: 1.5; 75% were female). The racial composition of the sample was predominantly non-Hispanic White (80%), and a significant portion of participants (40%) reported past abuse. The majority of participants (80%) completed three in-person sessions, and 45% completed all four in-person sessions.	The study found a significant reduction in SI as measured by SIQ scores, which were 114.69 (SD: 26.58) at baseline, 59.92 (SD: 50.22) at the end of treatment, and 39 (SD: 34.59) at 6-month followup. At 1-year postdischarge, one patient made a SA, and five were readmitted due to suicide risk.

Author, Year, Study Design	Description	Main findings
Hill et al., 2023[103], Before-After Study	Supporting Grieving Teens (SGT) is a web-based intervention. SGT consisted of two, 30- to 40-minute web-based sessions with a clinician present that followed a behavioral approach, incorporating social support-building activities and scheduling pleasant interpersonal activities to improve connections to others. Patients were 32 adolescents aged between 12 and 17 years, seeking bereavement services who had a thwarted belongingness score on the INQ. 87.5% of the patients were female. 31.3% of the patients were Hispanic and 31.3% were African American.	Evaluation of outcomes suggested that the intervention was associated with a small but significant reduction in thwarted belongingness (INQ, pretreatment: 32.75 vs. posttreatment: 28.17 vs. 4-month followup: 24.85) and depressive symptoms (as measured by the Short Mood and Feelings Questionnaire [SMFQ], pretreatment: 13.19 vs. posttreatment: 11.13 vs. 4-month followup: 6.48). Suicide ideation measured by SIQ-JR scores indicated a nonsignificant reduction decreasing from a mean of 20.85 (SD: 17.67) at pretreatment to 11.12 (SD: 11.17) at 4-week followup. Two patients (6.25%) withdrew during treatment and four more were lost during the 4-week followup.

Abbreviation: C-SSRS = Columbia-Suicide Severity Rating Scale; INQ = Interpersonal Needs Questionnaire; PTSD = posttraumatic stress disorder; RCT = randomized clinical trial; RFPP-S = Reminder-Focused Positive Psychiatry and Suicide Prevention; SD = standard deviation; SGT = Supporting Grieving Teens; SIQ = Suicidal Ideation Questionnaire; SIQ-JR = Suicidal Ideation Questionnaire-Junior; SMFQ = Short Mood and Feelings Questionnaire; TAU = treatment as usual

3.2.2.3. School-Based/Community-Based Interventions

School-based/community-based interventions consist of psychosocial interventions designed for implementation within a school or community setting and are designed to enhance skills and/or social support for high-risk youths or for populations.

3.2.2.3.1. Social Network Interventions

Social network interventions are designed to be adjunctive treatments that enhance social support for suicidal youths.

Two RCTs reported in three articles with 737 patients evaluated social network interventions.[65, 88, 90] The median age of the patients was 15.45 years (range: 15.3–15.6 years); 69.67% were female. 83% of the patients were White, 8.4% were African American, and 1.8% were Hispanic. 40.35% of the patients had previous SAs. Both studies were conducted in the United States. The followup ranged from 6 to 168 months. One study was published before the year 2010. Both were conducted in school/community settings. The descriptions and main findings of the individual studies are listed in Table 15. Appendix Table D.11 lists study characteristics. Details of the interventions used in each study can be found in Appendix Table E.11.

Appendix Table F.11.1 lists the risk of bias for each study. Overall, the risk of bias for the RCTs was moderate to high due to moderate risk from deviations from intended interventions and high risk from measurement of outcomes.

Table 15. Description and main findings of individual studies for social network interventions

Author, Year, Study Design	Description	Main findings
King et al., 2006[90], RCT	Youth-Nominated Support Team Version I (YST-I) is a psychoeducational social network intervention for suicidal adolescents. YST-I provided tailored psychoeducation to youth-nominated adults in addition to weekly check-ins for three months following hospitalization. Two hundred eighty-nine psychiatrically hospitalized adolescents aged between 12 and 17 years were randomized to TAU+YST-I or TAU. 68.2% of the patients were female. 82.4% of the patients were White, and 10.2% were African American.	At 6 months, there was no significant difference between the two groups on SI (as measured by SIQ-JR; mean 22.7 vs. mean 25.8), SAs (17.3% vs. 11.6%), depression (Reynolds Adolescent Depression Scale [RADS]; mean 65.2 vs. mean 66.5), and functional impairment (as measured by YST internalizing scores; mean 56.2 vs. mean 57.4). In subgroup analysis, among female patients, TAU+YST-I reported significantly greater reduction on parent-reported mood-related functional impairment. Significantly more patients in the TAU+YST-I group withdrew than those in the TAU only group.
King et al., 2019[65, 88], RCT	Youth-Nominated Support Team Version II (YST-II) is an intervention to facilitate social support for adolescents hospitalized for suicidality. YST-II provided tailored psychoeducation to adults who were nominated by the suicidal youth After training, the adults participated in weekly check-ins with the youth for three months following hospitalization. The treatment was designed to be a supplement to standard treatments. Participants were 448 psychiatrically hospitalized adolescents aged between 13 and 17 years who were randomized to YST-II or TAU. Both the YST-II groups and the TAU group shared a similar mean age of approximately 15.6 years. The majority of participants were female (71.2%) and White (over 83% in both groups).	At the end of treatment and 9 months posttreatment, there were no significant differences between YST-II and TAU in SAs, SI (as measured by SIQ-JR), depression (as measured by CDRS-R), hopelessness (as measured by BHS), and functions (as measured by Child and Adolescent Functional Assessment Scale [CAFAS]). There was also no significant difference in number of study withdrawals. No patients withdrew due to adverse events. At 11-14 years posttreatment, one patient died due to suicide in the YST-II group, compared with three suicide deaths in the TAU group (HR=3.05, 95% CI: 0.32 to 29.31).

Abbreviations: BHS = Beck Hopelessness Scale; CDRS-R = Children's Depression Rating Scale- Revised; CAFAS = Child and Adolescent Functional Assessment Scale; CI = confidence interval; HR = hazard ratio; RADS = Reynolds Adolescent Depression Scale; RCT = randomized clinical trial; SA = suicide attempt; SI = suicidal ideation; SIQ- JR = Suicidal Ideation Questionnaire-Junior; TAU = treatment as usual; YST-I = Youth-Nominated Support Team Version I; YST-II = Youth-Nominated Support Team Version II

3.2.2.3.2. School-Based Skills Interventions

School-based skills interventions are interventions delivered within the school setting, designed to enhance coping skills for youths at risk for suicide.

Two RCTs[33, 102] and one before-after study[77] with 3965 patients evaluated school-based skills interventions. The median age of the patients was 14.40 years; 52.6% were female. 40% of the patients were White, 45.85% were African American, and 7% were Hispanic. Two studies were conducted in the United States, and one was in Canada. The median followup was 5.83 months, ranging from 2.5 to 12 months. One study was published before the year 2010. All studies were conducted in school/community settings. The descriptions and main findings of the individual studies are listed in Table 16. Appendix Table D.12 lists study characteristics. Details of the interventions used in each study can be found in Appendix Table E.12.

Appendix Table F.12.1 lists the risk of bias for each study. Overall, the risk of bias for the RCTs was high due to moderate to high risk from deviations from intended interventions and high risk from measurement of outcomes. The risk of bias for the before-after study was high.

Table 16. Description and main findings of individual studies for school-based skills interventions

Author, Year, Study Design	Description	Main findings
Randell et al., 2001[102], RCT	Adolescents at risk of not completing high school and at risk of suicide were randomized to one of the three interventions: Counselors CARE (C-CARE) plus a 12-session Coping and Support Training (CAST) peer-group intervention, C-CARE only, or TAU. C-CARE represented three 4- to 5-hour intervention sessions focused on coping delivered by advanced practice clinicians. CAST was a 12-session life skills training program. TAU was an individually administered assessment using suicide scales, followed by facilitating connections with school and parents per school policy. The 341 participants were diverse, 40% were White, 13% were mixed ethnicity, and 12% were African American. Across the 3 groups, 41%–52% of the participants were male with age ranging from 14 to 19 years.	At the end of treatments, all three groups showed equivalent decreases in suicide risk behaviors (i.e., suicidal thoughts, threats, and attempts), anger control problems, and family distress. Compared with TAU, both C-CARE plus CAST and C-CARE led to significant decreases in depression, enhanced self-esteem, and meeting family goals. There was no significant difference on the number of study withdrawals between the three groups.
Robinson et al., 2023[33], RCT	The RCT compared the Adapted-Coping With Stress course (A-CWS) with standard care. The A-CWS was a school-based, culturally grounded, cognitive-behavioral group protocol tailored for African American adolescents, consisting of 15 sessions, each lasting 45 minutes, with groups comprising 8 to 10 students; while standard care included a comprehensive intake assessment, and a range of services from brief behavioral interventions to one-on-one or group sessions. The participants were 380 ninth-grade students living in low-resourced neighborhoods, the average age was 14.5 years (SD: 0.59). 79.8% of the participants were self-reported African American, and 12.4% self-reported more than one race.	At 12-month followup, there was no significant reduction in SI measured by CES-D appended SI items when comparing the A-CWS with standard care. However, among those with higher baseline SI, students in the A-CWS group reported significantly more reduction in SI than those in the standard care group. There was no significant difference on study withdrawals.
Silverstone et al., 2015[77], Before-After Study	The study evaluated a school-based intervention, the Empowering a Multimodal Pathway Towards Healthy Youth (EMPATHY), in 3,244 students aged between 11 and 18 years.[77] The EMPATHY program included screening for depression, suicidality, anxiety, use of drugs/alcohol/tobacco (DAT), quality of life, and self-esteem and consisted of an 8-session, internet-based CBT program to increase resiliency to depression. For those identified as active suicidal and at high risk of self-harm (n=503), rapid interventions were provided, including an interview with students and family and guided internet-based CBT.	At 12 weeks from baseline, there was a significant reduction on depression (PHQ-9), and suicidality (PHQ-9). For those identified as actively suicidal and at high risk of self-harm, EMPATHY significantly reduced depression (as measured by the PHQ-9), anxiety (as measured by the anxiety section of the Hospital Anxiety and Depression Scale), self-esteem (as measured by the Rosenberg Self-Esteem Scale), quality of life (as measured by the KIDSCREEN-10), and suicidality.

Abbreviations: A-CWS = Adapted-Coping With Stress; CAST = Coping and Support Training; CBT = cognitive behavioral therapy; CWS = Coping With Stress; DAT = drugs/alcohol/tobacco; EMPATHY = Empowering a Multimodal Pathway Towards Healthy Youth; n = number; PHQ-9 = Patient Health Questionnaire 9; RCT = randomized clinical trial; TAU = treatment as usual

3.2.2.3.3. Suicide Awareness/Gatekeeper Programs

Suicide awareness/gatekeeper programs are interventions designed to enhance student and/or staff members awareness of red flags for suicide in students to help them identify and report students at risk and link them with services.

One RCT[93] and three before-after studies[38, 47, 100] with 3,225 patients evaluated suicide awareness/gatekeeper programs. The median age of the patients was 13.78 years; 68.27% were

female. 44.66% of the patients were White, 14.5% were African American, and 20.26% were Hispanic. 3.6% of the patients reported previous SAs. Three studies were conducted in the United States, and one study was conducted in Mexico. The median followup was 8.62 months, ranging from 1.5 to 24 months. One study was published before the year 2010. Three studies were conducted in school/community settings, and one in a clinic setting. The descriptions and main findings of the individual studies are listed in Table 17. Appendix Table D.13 lists study characteristics. Details of the interventions used in each study can be found in Appendix Table D.13.

Appendix Table F.13 lists the risk of bias for each study. Overall, the risk of bias for the RCT was moderate due to moderate risk from deviations from intended intervention. The before-after studies were rated as high risk of bias.

Table 17. Description and main findings of individual studies for suicide awareness/gatekeeper programs

Author, Year, Study Design	Description	Main findings
Aseltine et al., 2004[93], RCT	Signs of Suicide (SOS) program is a school-based intervention combining suicide awareness curricula with depression screening. The study randomized 2,100 students from three public high schools in Connecticut and two public high schools in Georgia to the SOS program or the control group. The control group consisted of health or social studies classes. The majority of participants were Hispanic (59%), followed by non-Hispanic African American (20%) and non-Hispanic White (6%).	At 3 months postintervention, compared with the control group, the SOS program reported a significant reduction in SAs (3.6% vs. 5.4%), with an odds ratio (OR) of 0.63 (95% CI: 0.42 to 0.94). There was no significant difference in SI (OR=0.76, 95% CI: 0.57 to 1.02). Female students were significantly more likely to report SI and SAs. Students with English as a second language were more likely to endorse SAs. African American students reported significantly lower rates of SAs and SI, compared with Hispanic students or White students.
Sale et al., 2022[47], Before-After Study	The study evaluated a suicide-specific continuity of care model as a way of decreasing SI and SAs, as well as reducing ED visits and hospitalization in youths under the age of 25 years at risk for suicide. Youths were identified as high risk and referred by staff members at community behavioral clinics, EDs and inpatient units, as well as through community programs and schools that involve gatekeeper programs to identify students at risk. Patients received weekly visits from trained mental health providers and had access to an array of services that, after stabilization, was adjusted to fit their needs. Treatment ranged from 3 to 7 months. Youths remained in care until they were no longer suicidal. The study recruited 376 adolescents. Of these patients, 29.1% were 8-13 years, 51.9% were between 14-17 years and 19.8% were between 18-24 years of age. 62.7% of the participants were female, 5.6% were transgender, 75.4% were White, and 6.1% were African American.	After 6 months, there was a significant reduction in SAs (baseline 0.31 in the past 90 days vs. 6-month followup 0.07 in the past 90 days), psychiatric hospitalizations for SAs and ideation (baseline 0.17 vs. 6-month followup 0.05), ED visits (baseline 0.19 vs. 6-month followup 0.07), and SI (measured by C-SSRS) (baseline 86.0% vs. 6-month followup 40.9%).

Author, Year, Study Design	Description	Main findings
Rivero et al., 2014[100], Before-After Study	CARE Net (Consultation and Resource Evaluation) program, a multifaceted intervention involving risk assessments, planning to avoid self-harm, consultations for necessary services, and educational interventions that involved parents and aimed to maintain the students' academic participation. The study consisted of 108 college students who were predominantly female (59%). The ethnic composition of the participants was 42% White, 12% African American, 8% Asian or Asian American, and 7% Hispanic. A significant portion of the participants (34%) were referred to the program after engaging in serious self-harm, reflecting the program's focus on high-risk individuals. Eleven participants (10.2%) did not complete the program.	Student grade point average (GPA) significantly dropped during the semester from mean 2.92 to mean 2.59 when the suicidal incident occurred, but GPA significantly rebounded for students who completed the CARE Net program and were retained at the university for the semester subsequent to the incident and CARE Net intervention (mean 2.82). Students who completed the program reported significantly higher GPA in the semester in which the students were referred to the CARE Net program than those who did not complete the program (mean 2.66 vs mean 1.97). Outcomes for suicide or SI were not reported.
Hermosillo-de-la-Torre et al., 2023[38], Before-After Study	The study followed a sample of 18 adolescents who completed a DBT program, Socio-emotional Skills Learning Program informed by DBT. The program consisted of twenty-five, 120-minute, group sessions that covered five DBT modules. The participants were aged between 11 and 14 years, were female, and were from a northwestern region of Jalisco, Mexico. The participants were characterized as from a “medium-low socioeconomic stratum.” The study outcomes focused on suicidal behavior, depressive symptoms, psychosocial risks, and protective factors.	The findings showed statistically significant decreases in SI (as measured by Roberts Suicidal Ideation Scale), emotional dysregulation, and depression (as measured by CES-DR), compared with baseline. There was no significant difference in SAs measured by the Suicidal Behavior Questionnaire.

Abbreviations: CES-DR = Center for Epidemiologic Studies Depression Scale Revised; CI = confidence interval; C-SSRS = Columbia-Suicide Severity Rating Scale; DBT = dialectical behavior therapy; ED = emergency department; GPA = grade point average; OR = odds ratio; RCT = randomized clinical trial; SA = suicidal attempt; SI = suicidal ideation; SOS = Signs of Suicide

3.2.2.3.4. Community-Based, Culturally Tailored Adjunct Programs

Community-based, culturally tailored adjunct programs are designed specifically for high-risk youths or youths from communities at risk. These programs use cultural considerations to inform multi-component treatments designed to target risks and specific barriers to treatment within communities at risk.

A total of three original studies (1 comparative observational study[99] and 2 before-after studies[73, 74]) with 258 patients were included. The median age of the patients was 14.54 years (range: 14.3–14.9 years); 78% of the patients were female. One study exclusively evaluated Hispanic patients. 17% of the patients reported previous SAs. All three studies were conducted in the United States. The median followup was 13 months, ranging from 3 to 24 months. None of the studies were published before the year 2010. All studies were conducted in school/community settings. The descriptions and main findings of the individual studies are listed in Table 18. Appendix Table D.14 lists study characteristics. Details of the interventions used in each study can be found in Appendix Table E.14.

Appendix Table F.14 list the risk of bias for each study. The comparative observational study and two before-after studies were rated as high risk of bias.

3. Results

Table 18. Description and main findings of individual studies for community-based, culturally tailored adjunct programs

Author, Year, Study Design	Description	Main findings
Allen et al., 2018[99], Comparative Observational Study	The study evaluated a strengths-based, multi-level, community/cultural intervention in Yup'ik communities in southwest Alaska. The treatment group (n=54) received a high intensity version of the intervention with numerous activities attended by the participants. The treatment consisted of 26 modules. Each module promotes 2 to 4 protective factors such as communal mastery, problem solving and joining with others in the social environment, community mobilization, spiritual wellness, rites of passage, and alcohol awareness. Family modules reviewed content such as strengths-based parenting. Modules are taught through story, games and activities. The comparison group (n=74) received a lower intensity version with fewer modules. The treatment group had a mean age of 14.24 years (SD: 1.72), and 31% were female. The comparison group had a mean age of 14.62 years (SD: 1.82), and 20% were female.	The treatment group showed a significant increase in "Reasons for Life," a cultural adaptation and strengths-based extension of the Brief Reasons for Living Inventory for Adolescents indicating factors protective against suicide risk, while the comparison group showed no significant change. The difference of "Reasons for Life" between the two groups were significant (d=0.27, p<0.05). There was no significant change on Reflective Processes, adapted from the adult Yup'ik Protective Factors scale, reflecting the perception of the potential negative consequences of drinking alcohol.
Humensky et al., 2017[73], Before-After Study	The study evaluated the Life Is Precious (LIP) program, a community-based adjunctive treatment that promoted family relationships, academic support, creative expression, and wellness education activities among 107 Hispanic female adolescents who had experienced a SA or SI (mean age=14.9 years; SD: 2.3 years). LIP also aimed to improve depressive and trauma-related symptoms, along with SI. The participants were Puerto Rican (29%), Dominican (24%), Mexican (24%), and other Hispanic origins. A quarter of the participants had experienced sexual abuse, underlining the program's critical role in supporting vulnerable youths. Co-occurring conditions were common, with 45% reporting symptoms of depression. 17% of the adolescents reported SAs.	After enrollment, scores on Suicidal Ideation Questionnaire (SIQ), decreased by approximately one-fifth of a point per month. This reduction in SI was more pronounced in individuals reporting a history of sexual abuse, tobacco use, or alcohol use. During the study period (up to 24 months), no patients reported SAs or suicide deaths. Depressive symptoms, anger, posttraumatic symptoms, and family adaptability also decreased significantly (p<0.01). There were also no significant differences in measures of anxiety, dissociation, sexual concerns, and family cohesion.
Cwik et al., 2016[74], Before-After Study	The New Hope project is a psychoeducational program that teaches coping skills to reduce suicide risk, including emotion regulation, cognitive restructuring, social support, self-efficacy, and safety planning. The New Hope project also supported participants in overcoming barriers to treatment motivation, initiation, and adherence. The New Hope project was designed to be an adjunctive treatment to standard mental health services, comprising 1 to 2 visits with a total of 2 to 4 hours, delivered in-home and aimed to strengthen connections with local outpatient mental health resources and other culturally appropriate care providers. The study recruited 18 adolescents (mean age=14.3 years; 92% were female) from the White Mountain Apache Tribe in Arizona. Thirteen participants completed the program.	The findings suggested that the intervention was effective in reducing negative cognitions (Children's Negative Cognitive Errors Scale), depressive symptoms (CES-D), and ED visits for mental health reasons (from baseline 9 times to 0.3 times at 3 months). The proportion of the participants scoring above the clinical cutoff for SIQ (>30) and SIQ-JR (>23) decreased significantly from 64% (7 out of 11) at baseline to 10% (1 out of 10) at 3 months posttreatment, highlighting a substantial reduction in SI among the participants.

Abbreviations: CES-D = Center for Epidemiologic Studies Depression Scale; ED = emergency department; LIP = Life is Precious; n = number; SA = suicidal attempt; SD = standard deviation; SI = suicidal ideation; SIQ = Suicidal Ideation Questionnaire; SIQ-JR = Suicidal Ideation Questionnaire-Junior

3.2.2.4. Pharmacological/Neurotherapeutic Interventions

We identified only one study examining a pharmacological treatment in the treatment for suicidal youths.[87, 89] The details of the study and related findings can be found in Section 3.2.2.1. There were no eligible studies evaluating neurotherapeutic interventions.

Discussion

4.1. Study Overview and Summary of Main Findings

We conducted a systematic review to assess the comparative effectiveness of treatments for suicidal thoughts and behaviors in youths (aged 5 to 24 years) at heightened risk for suicide. This population included youths with one or more of the following characteristics: suicidal ideation (SI), behaviors and/or suicide attempts (SA), command hallucinations, high scores on measures of suicide risk, gender diverse youths or members of racial/ethnic minority groups at increased risk of suicide, and youths exposed to violence or crime. Our review focused on psychosocial interventions, pharmacological therapies, neurotherapeutic treatments, or a combination thereof. We aimed to identify moderators and mediators of treatment outcomes, including demographics, social determinants of health, exposure to racism, healthcare disparities, and psychiatric or developmental comorbidities. To maximize the identification of novel and scalable treatment options, we included randomized clinical trials (RCTs), comparative observational studies, and before-after studies.

The psychosocial interventions identified in this review were numerous and diverse and have been categorized as:

1. *Psychotherapy Interventions* comprising Cognitive Behavior Therapy (CBT), Dialectical Behavior Therapy (DBT), Collaborative Assessment and Management of Suicidality (CAMS), Attachment-Based Family Therapy (ABFT) and, Family-Focused Therapy (FFT)
2. *Acute Interventions* comprising interventions offered mostly in the context of an emergency department (ED) or inpatient setting and characterized as safety planning, motivational interviewing crisis interventions, family-based crisis management interventions, continuity of care following crisis, or brief adjunctive treatments (1–4 sessions)
3. *School/Community-Based Interventions* comprising interventions designed for high-risk youths or populations at risk including social network interventions, school-based skills interventions, suicide awareness/gatekeeper programs, and culturally tailored, community-based, adjunct treatments

4.1.1. Traditional Psychotherapy Interventions

In spite of having the most RCTs of any intervention for suicidal youth, low strength of evidence (SOE) suggests that CBT was not superior to treatment as usual (TAU) in reducing SI or SAs at long-term followup. These studies evaluated well-designed, high-quality versions of CBT that included multiple components that considered the unique needs of high-risk adolescents. Participants were mostly recruited from acute settings and had extensive psychiatric comorbidities or other risks for suicide, such as homelessness or substance abuse. Although participants were predominantly White, non-Hispanic, and female, several studies examined a culturally tailored form of CBT designed specifically for Hispanic adolescents.

Low SOE suggests DBT, designed as a multi-component (e.g., individual therapy, skills groups, therapeutic consultation team meetings, skills coaching) outpatient treatment package may reduce the risk of suicidal outcomes (SI and SAs). However, this effect was not durable. general, there was less support for adapted, abbreviated formats of DBT (e.g., skills training only) as offered in the hospital or in intensive programs for the reduction of suicidality,

hospitalization, or emergency department (ED) visits. Patients treated in these studies were predominantly female but were diverse in terms of race/ethnicity.

Insufficient SOE was found about the efficacy for ABFT in racially diverse and lesbian, gay, bisexual, transgender, questioning, or queer (LGBTQ+) youths. Although it was more effective than usual care in reducing SI and behavior, it was not more effective than nondirective family therapy.[86] Such findings suggest the active ingredient may be family therapy. Relatedly, a single trial of FFT, a family therapy designed for youth with bipolar disorder, found lower, but not statistically significantly different, rates of suicidal events compared with TAU in youth at risk for bipolar disorder over a four-year period. Insufficient SOE suggests CAMS was not superior to TAU in reducing suicidal outcomes at long-term followup in a predominantly white, yet nearly 40% male identifying sample. Moderation analyses suggest lower risk patients tend to do better in CAMS compared with TAU, which is consistent with its design as a scalable, brief, safety planning intervention.[52]

4.1.2. Acute Intervention

Low SOE suggests that acute interventions were associated with minimal difference in SI and SAs in adolescents presenting mostly to acute/crisis settings. There was minimal support for acute safety planning interventions over TAU in reducing SI and attempts in youths presenting to ED settings or in those who were hospitalized for suicide risk.[67, 70] Although family-based crisis management did not shower lower rates of SAs at followup compared with standard ED care, it was associated with fewer hospitalizations.[69, 80, 84, 96] Continuity of care interventions such as rapid outpatient appointments or contact (e.g., text or telephone calls) following discharge from the ED for a suicidal crisis showed no benefit over care as usual.[49, 63, 94] Motivational interviewing crisis interventions offered in the ED or on inpatient psychiatric units for suicidal adolescents also showed no benefit over ED care as usual.[59, 71, 78] Acute adjunct interventions included 1 to 2 session, web- or video-based interventions. Of these interventions, only a 4-session, in-person, trauma-focused intervention that taught resilience skills with weekly calls and text messages reminders of skills showed a reduction in suicidal outcomes at followup compared with TAU.

4.1.3. School/Community-Based Interventions

Low SOE suggests no differences in SI and SAs using school/community-based interventions. Notably, school and community-based interventions were heterogeneous, spanning a diverse array of programs for suicidal youths or those from populations at risk for suicide. Although a novel social support, adjunct treatment was not superior to TAU in suicidal outcomes a secondary analysis found significantly lower rates of mortality in the Youth-Nominated Support Team (YST) group over a long-term period (i.e., 11 to 14 years). School-delivered, skills-based individual or group programs were not superior to control treatments in reducing SI or attempts.

Although a school-based suicide awareness program and depression screening was associated with an increase in students' reporting of suicide risk in themselves and their peers within high schools with a high prevalence of minority students, only limited evidence exists to support school-based awareness or gatekeeper programs in reducing suicide overall.[93] Finally, there is preliminary evidence for culturally relevant, community-based interventions for decreasing suicide risk among suicidal adolescents within at-risk communities that included Hispanic

adolescent females, White Mountain Apache tribe members, and the Yup'ik communities in Alaska. Yet, more rigorous trials are necessary to support these programs.

4.1.4. Pharmacological/Neurotherapeutic Interventions

We identified only one study examining a pharmacological treatment in the treatment for suicidal youths. Given that this study evaluated medication in combination with CBT and presented only before after results, the efficacy of this intervention could not be ascertained[87, 89] There were no eligible studies evaluating neurotherapeutic interventions. As such, the evidence base on pharmacological treatment and neurotherapeutic interventions for suicidal youths is largely nonexistent.

4.2. Implication for Clinical Decisions and Applicability

We found the youth population studied in the literature to be representative and inclusive of racial and ethnic minorities and at-risk individuals. Thus, the populations studied were not predominantly White individuals as we have observed in other types of research. Specifically, five studies evaluated solely or primarily Hispanic adolescents,[36, 38, 73, 75, 93], three evaluated solely or primarily African American youths[33, 86, 104] two evaluated solely or primarily the Native American youths,[74, 99] two evaluated solely or primarily the LGBTQ+ youths,[44, 83] and three evaluated solely or primarily youths with alcohol/substance-use disorders.[71, 85, 91] However, as a whole, the urgency of global efforts toward arresting youth suicide has not been matched by the evidence base to provide evidence-based interventions. We did not find compelling evidence supporting the benefit of any category of psychosocial intervention or pharmacological treatment for reducing SAs over TAU. The findings that the psychosocial intervention largely did not outperform control treatments, suggest the possibility that therapeutic factors common to psychotherapeutic approaches (e.g., empathy, warmth, therapeutic alliance) or contact with the healthcare system might contribute to more variance in outcome than the therapeutic strategies themselves. It is worth mentioning that control treatments also improved suicidal outcomes and may have contributed to the lack of overall differences between the interventions. In fact, the field of suicide treatment research, potentially more than other fields of treatment research, is beholden to ethical principles to ensure that all adolescents receive proper care. As such, the control treatments were well designed and matched for level of therapeutic contact and intensity. Given the severity of this population, it is likely that patients in TAU were referred to skilled clinicians known in their community for their experience in treating suicidal youth. Many control treatments were enhanced with psychoeducation, treatment planning information, and contacts by study staff during the treatment period to problem solve issues with the adolescent. Given that many of these treatments evaluated in this review (e.g., CBT, DBT, safety planning) have been widely disseminated for the treatment of comorbid conditions (e.g., depression, nonsuicidal self harm, borderline personality disorder), it also possible that TAU incorporated active treatment strategies that were similar to the experimental intervention such as safety planning, emotion regulation skill building, cognitive restructuring, problem solving and family engagement which may have reduced the ability to detect differences in outcomes.

In any case, the findings of this review suggest there is room to improve currently available treatments for suicidal youth and that we should not be content with the status quo. Given that many of these treatment models were adapted from adult interventions (e.g., DBT, CBT, CAMS), they may not be suited to adolescents' unique cognitive and emotional development and

psychosocial circumstances. As such, the field would benefit from the development of interventions that are developmentally and contextually tailored for youth.

Although comprehensively studied, there was not overwhelming evidence for the effect of any category of psychotherapy in reducing SI or attempts over TAU. Although there were benefits for some of the treatments in reducing symptoms of depression and other psychological risk factors, as well as NSSI and hospitalizations, widely disseminated treatments such as CBT and DBT showed uncertain benefit over control treatments in reducing suicidal outcomes for youths.[8, 108, 109] Even CBT treatment approaches that were culturally tailored for specific populations were not superior to control interventions when matched for treatment contact and format. Moreover, most CBT and DBT interventions examined in these studies were structured, intensive, multi-component interventions that involved caregivers. Nonetheless these treatments, along with adapted versions such as DBT skills training incorporated into inpatient programming showed unclear benefit in reducing suicidality.

Similar to CBT and DBT, there was no evidence for CAMS, a short-term weekly therapy involving safety planning and coping strategies, in reducing suicidal thoughts and behaviors over TAU. It is possible that therapists in the community also incorporate safety planning interventions and coping skills into sessions with suicidal youths, and thus CAMS may not be vastly different from what generally occurs in clinical practice. Yet, the treatment showed some benefit over TAU for less severe participants suggesting it might be a scalable treatment option in these cases.

Given that CBT, DBT, and CAMS have shown some effectiveness in reducing suicide risk in adults, it is possible that the modifications of these treatments for adolescents may have reduced their effectiveness, such as shortening DBT from 12 months to 6 months (i.e., dialectical behavior therapy for adolescents [DBT-A]).[8, 108-110] Alternatively, the divergent findings for adolescents may highlight that youths are not “little adults” and require the development of novel therapeutic approaches that take into account their distinct cognitive, developmental, and contextual characteristics.

Although ABFT did outperform usual care for reducing SI and clinical recovery at followup, there was no difference between ABFT and a family therapy control treatment for these outcomes, suggesting that family therapy may be the active ingredient. That family therapy may moderate treatment outcomes is highlighted by positive outcomes from the single trial of FFT, a family therapy designed to enhance family support and reduce expressed emotion in families of suicidal youths with mood disorders. Given these findings, therapists working with suicidal youths who experience family distress should consider interventions to enhance family support.

Similar to psychotherapy interventions, there were few acute treatments that stood out as more effective than care as usual. Most surprising was the lack of compelling evidence for safety planning interventions, with or without motivational enhancement, over TAU. It should be noted that many of the safety planning approaches evaluated were structured, multi-component interventions. It is possible that adolescents assigned to TAU also participated in safety planning in the context of followup outpatient care, and this contributed to the null findings.. This lack of evidence of course should not mean that safety planning be discarded, but instead that youths and families in crisis require additional support and structure to implement a safety plan, particularly in the context of trauma, common among suicidal youths. As such, healthcare institutions grappling with the youth suicidal crisis may consider implementing and simultaneously evaluating the outcomes of family-based interventions. Since inaction is not an option, real-world evaluation is advisable.[41]

4. Discussion

The evidence is mixed on whether followup calls or texts following suicidal crises are beneficial, and it seems to depend on the number of calls for sustaining safety. As such, programs implementing followup contacts for suicidal youths should consider the need for maintaining frequent, regular contact with patients over longer periods of time.

Given the high attrition from standard psychotherapies, single-session, scalable interventions to reach more youths have been developed and explored. However, at this time, there is little evidence for acute adjunct web- or video-based interventions, at least in their current form. The lack of evidence might suggest that the content (e.g., CBT), format (e.g., digital), or the dose of these acute treatments is not adequate for suicidal adolescents. However, in person, acute treatments, delivered by trained therapists did not improve suicide outcomes over usual inpatient care. Although it might be reasonable to assume that more education and skills delivered to young patients would be helpful, clinicians should also consider whether adding adjunct treatments involving skills training and extra reminders might add extra burden to patients and families with limited resources and chronic stress. In general, the applicability and scalability of some interventions, such as DBT, which is intensive, requires patient and family commitment, is time consuming, and requires special training are concerning. Yet, it is encouraging that one brief, scalable intervention for psychiatrically hospitalized youth that showed promise in reducing suicidal outcomes was reminder-focused positive psychiatry (R-FPP), a trauma-focused treatment using positive psychology principles to manage trauma reminders.

In the absence of strong support for psychosocial or acute treatments, novel community-based efforts have been examined. One innovative approach to address suicide has been to expand support beyond the psychotherapist to other caring adults in the young person's life who are trained to provide regular support to the suicidal youths. Based on preliminary support for this approach, along with empirical data indicating that youths' perception of thwarted belonging is a common factor in suicide, efforts to enhance the young person's community of support may represent a pragmatic adjunct intervention for youths at risk. Given that these interventions are not dependent on the acquisition of skills or additional treatment sessions and view suicide as a systemic rather than individual level problem, such social network approaches hold the potential to enhance social support and reduce treatment burden on youths and families.

Finally, it gives us pause to learn that the commonplace assertion that psychopharmacological interventions, such as selective serotonin reuptake inhibitors (SSRI) or serotonin–norepinephrine reuptake inhibitors (SNRIs), are lifesaving treatments is made without empirical support or rigorous attempts to generate empirical data on the effectiveness of medication treatments for reducing suicide outcomes in suicidal youths. Although ethical issues are commonly cited as impeding such studies, we now stand three decades into the widespread adoption of these interventions for children, despite not evaluating their effectiveness. A burden remains on policymakers to align the support of interventions with the evidence base.

Although many policymakers and clinicians have extrapolated the benefits of psychopharmacological treatments for suicidal youths from studies of SSRIs in youths for other conditions, such as depression, RCTs on SSRIs suggest a small but statistically significant rate of suicidal behavior in youths randomized to the active medication compared with placebo. The FDA review on published and unpublished trials, which precipitated the current Black Box Warning examined 23 RCTs in youths, finding an increased odds of suicidality compared with placebo.[111] Given that most of these trials excluded suicidal participants,[21] it is unclear whether such psychopharmacological treatments have similar adverse events for suicidal youths. Without

data on the benefits or harms of pharmacological interventions for suicidal youths, we cannot make recommendations about whether these treatments should be an integral part of their care.

However, given pervasive efforts to disseminate medication interventions at a population level for distressed youths, it is likely that most youths enrolled in studies of psychosocial treatments for suicide were taking medications concurrently. Unfortunately, the treatment studies evaluated in this review provide little information about concomitant medication use, which limits our understanding of whether medication enhances or attenuates treatment outcomes and if a combination approach should be recommended. A similar absence of studies on the benefit or harms of neurotherapeutics or other novel biologic treatments (e.g., ketamine) for suicidal youths means that such treatments should remain experimental for suicidal youths at the present time.

4.3. Limitations

This review is limited by the high risk of bias of the included studies (42% RCTs, 100% comparative observational studies and before-after studies). Significant heterogeneity in interventions, comparisons, outcomes, and terms used to describe SAs and suicide risk led to an inability to perform meta-analysis and compare various interventions. Most RCTs highlighted here were underpowered and had short followup periods, thus they were unable to evaluate rare and distal events, such as SAs and deaths. In the context of small sample sizes and short followup periods, potentially effective interventions may show limited benefit. Additionally, the replication of positive trials was uncommon.

Psychosocial interventions were diverse and involved multiple therapeutic components. For example, safety planning interventions often included multiple therapeutic strategies (e.g., CBT, motivational enhancement), family involvement, followup calls, and other prevention measures (e.g., firearm restriction), making it difficult to determine if safety planning itself or one of the other treatment components was the active ingredient. Even treatments examined within the same category (e.g., CBT or DBT) were heterogeneous in format and content, and many included a combination of therapeutic approaches.

Across all studies, there was no assessment of adverse events, an unfortunate omission and ongoing blind spot within the literature at this time when evaluating vulnerable populations susceptible to treatment harm, particularly in the context of the potential for restrictive or involuntary treatments to cause retraumatization.

The review was also limited by inherent challenges in suicide research, most prominently, issues related to the measurement of suicide risk in the context of reliance on self-reported measures of SAs, ideation, and intent. Self-reported measures of suicidal thoughts and behaviors are not only limited by measurement error, but their validity can be influenced by psychological distress or conversely, the denial of suicide, in the setting of an intense wish to die or the prospect of an involuntary hospitalization. In addition, SI and intent commonly fluctuate, which can also influence the reliability and validity of measurements and make such measures poor predictive tools for future SAs. Finally, the research findings are limited to mostly adolescents (12-18 years) and predominantly female-identifying populations, and it may not be appropriate to generalize the results to males, youths who are ethnic/racial minorities, latency-aged children, and young adults. Lastly, this review focused on interventions to address increased risk for suicide and not on treatment of comorbid conditions associated with suicide or screening for suicide. Such literature has been synthesized and can aid in managing youth suicide.[18, 112]

4.4. Suggestions for Future Research

This review identified important gaps in the literature that can guide and inform opportunities for future research to address this public health crisis. Our review suggests the need for well-designed trials that are adequately powered with longer followup periods (e.g., 5 to 15 years) to evaluate the effectiveness and harms of these interventions on suicide events. Moreover, to understand which interventions works for whom, future research should examine moderators and mediators of treatment outcome. Yet, this exploration is predicated on the need for investigators to recruit more diverse populations, including youths who are ethnic/racial and sex/gender minorities, as well as other risk groups, including youths with intellectual disabilities or neurodiversity, and those with substance-use or other externalizing disorders. However, given the ethical issues inherent in randomly assigning suicidal youth to placebo interventions, the trials should be complemented by real world evidence studies consisting of large clinical and disease registries and pragmatic, longitudinal clinical data.[113]

Given that males make up a large portion of the deaths from suicide, yet most study participants have been predominantly female, investigators must make robust efforts to recruit male-identifying patients. Moreover, study interventions should be developed to address risk factors common to this population (e.g., isolation, substance abuse, externalizing behavior, and firearm exposure). Similarly, given that SI and attempts are prevalent in young adults and are on the rise in preadolescent children, studies evaluating the effectiveness of interventions in older (18 to 26 years), and younger (5-12 years) age groups are needed. Should research identify effective interventions, dismantling studies are necessary to determine which components (e.g., parent involvement, family therapy, or cognitive restructuring) are most beneficial so that scalable treatments can be developed and evaluated.

In the context of the widespread psychiatric bed shortages and the youth boarding crisis in the United States, we also need research on the presumed benefit and possible harms of hospitalization and other intensive programs for youths at heightened risk for suicide. To guide treatment decisions on the need for hospitalization or recommendations for residential treatment, research is needed on who hospitalization benefits, whether it reduces future suicide risk, as well as potential harms. The need to evaluate harms is particularly salient in the context of the intensive and restrictive nature of these interventions (e.g., inpatient, residential programs) which are not only expensive, but can be experienced as involuntary. Potential harms that should be evaluated in future research include treatment-related trauma and the impact of hospitalization on future help seeking. Future research on these and other potential harms of interventions is especially important when conducting studies of vulnerable youths and their families.

Studies are also needed to evaluate the potential burdens of interventions and ways to mitigate them to engage youths and families in treatments and reduce attrition and may include qualitative research on how various treatment components are experienced. For example, adolescents with histories of abuse, neglect, homelessness, bullying, parental abandonment, trauma, marginalization, poverty, family distress, discrimination, and/or structural racism may experience skill building approaches, such as invalidating or blaming, as they fail to address the wider ecosystem level contributors to their suffering.

Within these studies of psychotherapies, there were a few novel interventions that warrant future research. In particular, a comparative observational study of adolescent males with severe externalizing behaviors and suicidality,[104] found those allocated to mode deactivation therapy (MDT) showed significantly reduced suicide incidents compared with those who received CBT (10% vs 58%). While a larger RCT is necessary to validate these findings and determine whether

they are durable in long-term followup, the significant reduction in suicide events compared with CBT in adolescent males with severe externalizing behavior was notable and suggests this intervention deserves further research attention, particularly in the context of its distinct therapeutic approach from other interventions studied. For example, unlike CBT, the focus of MDT is not on challenging thoughts but on accepting and validating these cognitions in the context of the young person's past experiences while providing corrective experiences to revise core beliefs as well as regulatory skills to modify maladaptive behaviors. Such a trauma-informed approach may resonate with the unique developmental experiences (e.g., attachment disruptions, abuse, bullying, family conflict, and trauma) and environmental conditions (e.g., community violence, poverty, historical trauma, structural racism, and gender discrimination) that engender SI and behavior. In fact, there were several other promising interventions (e.g., MDT, reminder-focused positive psychiatry [R-FPP], integrated outpatient cognitive behavioral therapy [I-CBT]) that integrated trauma-specific interventions into their treatment protocols, suggesting the further development, evaluation, and implementation of trauma-informed approaches should be considered.

Finally, the notable absence of studies of pharmacotherapy, neurotherapeutic treatments, or other emerging biological treatments on suicide highlight a blind spot in the evidence base and a critical need for controlled trials of these interventions to determine their effectiveness and harms and to address the question regarding whether they attenuate or enhance outcomes when combined with psychosocial treatments.

4.5. Conclusions

This systematic review evaluated the effectiveness of psychosocial, psychopharmacological, neurotherapeutic, and emerging biological treatments in youths at risk for suicide and those from populations deemed at risk. We identified 31 RCTs, 12 comparative observational studies, and 18 before-after studies of psychosocial interventions categorized as Traditional Psychotherapy Interventions, Acute Interventions, and School/Community-Based Interventions. This review identified no studies on psychopharmacological, neurotherapeutic, or other biologic treatments in youths. The results suggested uncertain benefit of psychosocial interventions over TAU, including treatments that have shown benefit for suicidal adults and those that have been widely disseminated for suicidal youths, such as DBT and CBT. These findings may highlight the importance of common therapeutic factors, such as trust and therapeutic alliance over specific therapeutic strategies. Alternatively, these findings suggest the need for the development and evaluation of novel, developmentally and trauma-informed treatments rather than interventions that have been adapted from adult protocols.

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Abbreviations and Acronyms

ABFT	Attachment-Based Family Therapy
ABFT-LGB	Attachment-Based Family Therapy Adapted for Suicidal Lesbian, Gay and Bisexual adolescents
A-CWS	Adapted-Coping With Stress
A-DBT-A	Adaptation of Dialectical Behavior Therapy for Adolescents
AHRQ	Agency for Healthcare Research and Quality
AO-CBT	Adolescent-Only Cognitive Behavioral Therapy
ASAP	As Safe as Possible
ASIST	Alcohol and Suicide Intervention for Suicidal Teens
ASQ	Ages and Stages Questionnaire
BASC	Behavior Assessment System for Children
BCBT	Brief Cognitive Behavioral Therapy
BDI	Beck Depression Inventory
BDI-II	Beck Depression Inventory – Second Edition
BDI-Youth	Beck Depression Inventory-Youth
BHS	Beck Hopelessness Scale
BPOT	Brief Problem-Orientation
BRAVA	Building Resilience and Attachment in Vulnerable Adolescents
BSS	Beck Scale for Suicidal Ideation
CAFAS	Child and Adolescent Functional Assessment Scale
CAMS	Collaborative Assessment and Management of Suicidality
CAST	Coping and Support Training
CBCL	Child Behavior Checklist
CBQ	Children's Behavior Questionnaire
CBT	Cognitive Behavioral Therapy
CBT-SP	Cognitive Behavioral Therapy Focused on Suicide Prevention
CCC	Crisis Care Clinic
CDI	Children's Depression Inventory
CDI-2	Children's Depression Inventory-2
CDRS-R	Children's Depression Rating Scale-Revised
CES-D	Center for Epidemiological Studies-Depression
CES-DR	Center for Epidemiologic Studies Depression Scale Revised
CGAS	Children's Global Assessment Scale
CGI-I	Clinical Global Impression-Improvement Scale
CGI-S	Clinical Global Impression-Severity Scale
CI	Confidence Interval
CIS	Columbia Impairment Scale

C-SSRS	Columbia-Suicide Severity Rating Scale
CTSP	Cognitive Therapy for Suicide Prevention
CWS	Coping With Stress
DAT	Drugs/Alcohol/Tobacco
DBT	Dialectical Behavior Therapy
DBT-A	Dialectical Behavior Therapy for Adolescents
EC	Enhanced Care
ED	Emergency Department
EMPATHY	Empowering a Multimodal Pathway Towards Healthy Youth
E-TAU	Enhanced Treatment as Usual
EUC	Enhanced Usual Care
GPA	Grade Point Average
FBCI	Family-Based Crisis Intervention
F-CBT	Family-Focused Cognitive Behavioral Therapy
FE-NST	Family-Enhanced Nondirective Supportive Therapy
FFT	Family-Focused Therapy
GPA	Grade Point Average
HR	Hazard Ratio
I-CBT	Integrated Outpatient Cognitive Behavioral Therapy
ICD	Inventory of Cognitive Distortions
IGST	Individual and Group Supportive Therapy
INQ	Interpersonal Needs Questionnaire
IOP	intensive outpatient program
KHS	Kazdin Hopelessness Scale
K-SADS	Kiddie Schedule for Affective Disorders and Schizophrenia
LGBTQ+	Lesbian, Gay, Bisexual, Transgender, Questioning, or Queer
LIP	Life Is Precious
LPI	Life Problems Inventory
U.K. MHRA	United Kingdom Medicines and Healthcare Products Regulatory Agency
MADRS	Montgomery-Asberg Depression Rating Scale
MASC	Multidimensional Anxiety Scale for Children
MDD	Major Depressive Disorder
MDT	Mode Deactivation Treatment
MI-SafeCope	Motivational Interviewing-Safety Planning Intervention
MI-SP+text	Motivational Interview Enhanced Safety Plan Plus Additional Text Support
MI-SP	Motivational Interview Enhanced Safety Plan
n	Number

NSSI	Nonsuicidal Self-Injury
ODD	Oppositional Defiance Disorder
OR	Odds Ratio
O-TAU	Optimized Treatment as Usual
PA-CBT	Parent-Adolescent Cognitive Behavioral Therapy
PHQ-9	Patient Health Questionnaire 9
PICOTS	Population, Interventions, Comparators, Outcomes, Timing, Setting
PISQI	Pittsburgh Sleep Quality Index
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
PSR-SI	Psychiatric Status Ratings- Suicidal Ideation
PSS	Perceived Stress Scale
PTSD	Posttraumatic Stress Disorder
OR	Odds Ratio
QIDS-A	Quick Inventory of Depressive Symptomology – Adolescent
RADS	Reynolds Adolescent Depression Scale
RADS-2:SF	Reynolds Adolescent Depression Scale, 2nd Edition Short Form
RCT	Randomized Clinical Trial
RFL-A	Reasons for Living Inventory for Adolescents
RFPP-S	Reminder-Focused Positive Psychiatry and Suicide Prevention
RSQ-Anxiety	Response to Stress Questionnaire-Anxiety
RSQ-Avoidance	Response to Stress Questionnaire-Avoidance
SA	Suicide Attempt
SAS-SR	Social Adjustment Scale – Self-Report
SAFETY	Safe Alternatives for Teens and Youths
SBQ-23	Suicide Behavior Questionnaire-23
SBT	Skills-Based Treatment
SCARED	Screen for Child Anxiety Related Emotional Disorders
SD	Standard Deviation
SEADS	Supplemental Evidence and Data for Systematic Reviews
SGT	Supporting Grieving Teens
Sheehan STS	Sheehan Suicide Tracking Sheet
SI	Suicidal Ideation
SIQ	Suicidal Ideation Questionnaire
SIQ-HS	Suicidal Ideation Questionnaire-High School
SIQ-JR	Suicidal Ideation Questionnaire-Junior
SITBI	Self-Injurious Thoughts and Behaviors Interview
SITB	Self-Injurious Thoughts and Behaviors
SMFQ	Short Mood and Feelings Questionnaire

SNAP	Successful Negotiation Acting Positively
Socio-CBT	Socio-Cognitive Behavioral Therapy
SOE	Strength of Evidence
SOS	Signs of Suicide
SRT	Supportive-Relationship Treatment
SSF	Suicide Status Form
SSI	Scale for Suicide Ideation
SSI-W	Scale for Suicide Ideation-Worst Point
SSRI	Selective Serotonin Reuptake Inhibitors
STAT-ED	Suicidal Teens Accessing Treatment After an Emergency Department Visit
STAXI-2	State-Trait Anger Expression Inventory
TAU	Treatment as Usual
TOC	Teen Options for Change
U.S.	United States
YSR	Youth Self-Report
YST-I	Youth-Nominated Support Team Version I
YST-II	Youth-Nominated Support Team Version II