



Preventing Youth Suicide: Potential “Crossover Effects” of Existing School-Based Programs

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Abstract

Notable increases in youth mental health problems combined with strains on the already stretched mental health workforce raise concerns that there will be an ensuing increase in youth suicide thoughts, behaviors, and even deaths. Schools are recognized as crucial settings for youth mental health support and suicide prevention activities, yet schools also face staff shortages and ever-increasing responsibilities for student well-being. Evidence is emerging that prevention programs originally designed to improve problem-solving skills and social-emotional functioning in youth have demonstrated downstream, “crossover effects,” that is, unanticipated benefits, on youth suicidal behavior. Relatively little research on crossover effects has been conducted within school settings, despite the strong potential for commonly administered programs to have an impact on later suicide risk. We review key suicide risk factors and their proposed mechanisms of action; we also discuss factors that may protect against suicide risk. We then identify upstream prevention programs targeting the same factors and mechanisms; these programs may hold promise for downstream, crossover effects on youth suicide risk. This paper is intended to provide a framework to help researchers, practitioners, and policymakers as they consider how to prevent youth suicide using existing school-based resources. Rigorous investigation of upstream prevention programs is urgently needed to determine ideal approaches schools and communities can deploy to prevent youth suicide.

Keywords Youth · Suicide · School · Prevention · Crossover · Upstream

Introduction

Following a stressful 3 years of the COVID-19 pandemic including remote or hybrid schooling, many are concerned that observed increases in youth mental health problems combined with strains on the already stretched mental health workforce (Health Resources & Services Administration, 2022) and will result in an increase in youth suicide deaths (Curtin et al., 2021; Diliberti & Schwartz, 2022; Office of the Surgeon General, 2021). While overall youth suicide deaths remained relatively stable from 2019 to 2020, it is too soon to tell whether that pattern will hold, and for whom (Ehlman et al., 2022). Concerning suicide rates among certain groups of youth suggest the pandemic may exacerbate

risk. For instance, populations of marginalized youth, such as American Indian/Alaska Natives, have had elevated risk for decades (U.S. Senate, 2015). From 2014 to 2019, Asian or Pacific Islander and Black youth aged 15–24 experienced increases in suicide rates over time, whereas White youth did not (Ramchand et al., 2021). Bridge and colleagues (2018) reported that the suicide rate (2001–2015) in Black children aged 5 to 11 was twice the rate of White children (Bridge et al., 2018). The pandemic has hit these same communities particularly hard (Rossen et al., 2021), and the resulting effects of trauma and loss may add to existing risk. In addition, there are signs the pandemic may have exacerbated suicide risk for adolescent girls. Emergency department data show an increase in visits for suspected suicide attempts for adolescent girls during 2020 and 2021 relative to the same time periods in 2019; rates among boys remained stable (Yard et al., 2021). Sexual and gender minority (SGM) youth were also at elevated risk for suicide thoughts and behaviors prior to the pandemic compared to non-SGM youth (di Giacomo et al., 2018). For some SGM youth, isolation from support systems and living within unsupportive family

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environments during pandemic-related school closures may have compounded risk (Ormiston & Williams, 2022).

Schools are increasingly recognized as crucial settings for youth mental health support and suicide prevention activities, with recent data from the National Survey on Drug Use and Health (NSDUH) showing that very similar proportions of youth receive mental health care from schools as from outpatient mental health settings (Ali et al., 2019). Specifically, 35% of adolescents (ages 12–17) received mental health treatment in a school setting only; 23% received treatment in both school and non-school settings; and 42% received treatment in a non-school setting (e.g., specialty or general medical setting) (Ali et al., 2019). Even before the COVID-19 pandemic, state and federal legislatures enacted policies requiring schools to enhance and broaden suicide prevention training and programming, such that 13 states now require all school staff to have at least annual training in suicide prevention (American Foundation for Suicide Prevention, 2020). Schools are particularly important resources for racial and ethnic minority and low-income youth with mental health needs and suicide risk, with these groups significantly more likely than White and higher-income youth to receive treatment *only* in educational settings (Ali et al., 2019).

With an influx of additional funding from the American Rescue Plan and other federal, state, and local pandemic funding packages, many schools have found that they have increased financial resources to bolster their suicide prevention efforts. However, suicide is not the only behavioral health issue schools are tasked with addressing. Schools must also respond to multiple, simultaneous problems ranging from attention-deficit hyperactivity disorder (ADHD), posttraumatic stress disorder (PTSD), and depression to substance use and risky sexual behavior. Due to the pandemic, schools are also addressing new or exacerbated challenges like learning lags related to remote schooling, food insecurity, COVID-19 testing, masking and vaccination policies, and a lack of consensus on school curricula (Diliberti & Schwartz, 2022). It is not surprising that with this “perfect storm” of pressing issues and responsibilities, on top of the already challenging task of providing a high-quality academic education to children, school staff well-being has decreased, and mental health problems are more concerning than ever (Diliberti & Schwartz, 2022).

As schools consider effective and feasible suicide prevention efforts in this context, it is important to determine how and whether *existing* school mental health programs may already be addressing suicide risk (e.g., efforts that can prevent mental health problems and self-injurious thoughts and behaviors from happening in the first place). Prior research shows that mental health interventions designed to target emotional and behavioral problems that share risk factors with youth suicide can also help to decrease suicide thoughts and behavior (STB). For instance, interventions originally

designed to decrease substance use or depression in youth have demonstrated “crossover effects,” i.e., unanticipated benefits, for youth suicidal thoughts (Connell et al., 2019; Kerr et al., 2014; Sandler et al., 2016; Vidot et al., 2016). For example, a study on the long-term impact of the Good Behavior Game (GBG), a program for elementary-aged children designed to prevent risky behavior and aggression by improving problem-solving skills and social-emotional functioning, observed a reduced risk for suicidal thoughts and behaviors in young adulthood (ages 19–21) among intervention groups compared to control groups (Wilcox et al., 2008). Besides this GBG example, however, relatively little research on crossover effects has been conducted within the school setting, despite the strong potential for many common programs to have an impact on later suicide risk. For instance, social-emotional learning (SEL) is now a common component of most elementary school curricula and is intended to strengthen youth capacities like emotion regulation and social connectedness, which are both factors that protect against suicide risk (Wyman, 2014). If such programs are proven to be effective in reducing or preventing STB, this could have a major impact on the approach and resources that schools leverage. Rather than funding, implementing, and testing new suicide prevention initiatives, schools could save money, time, and potentially lives, by enhancing and expanding existing school-based programs demonstrating crossover effects on suicide risk.

The goal of this paper is to provide a roadmap for future research to test whether existing school-based programs have crossover effects on STB (defined to include self-harm with and without suicidal intent). First, we review some of the key suicide risk factors and proposed mechanisms of action. We also discuss factors that protect against STB. It is important to highlight, as Cha and colleagues (Cha et al., 2018) do, that the current suicide literature is often inconsistent in its use of operational definitions and terms, including terms such as “factor” and “mechanism.” To eliminate any potential confusion caused by those inconsistencies, we have included operational definitions and adhere to them in the discussion below. Such consistent use of terminology could aid the field in disseminating clear and consistent syntheses and recommendations. For the purposes of our discussion, risk factors are those environmental, biological, or psychological factors associated with a higher likelihood of experiencing suicidal thoughts and/or behaviors but—due to lack of evidence—cannot be assumed to directly *cause* those thoughts and behaviors. In contrast, protective factors are associated with a reduction in STB. A mechanism is the process by which a certain set of factors leads to (or protects against) suicide risk.

Upstream prevention programs targeting such factors and mechanisms may hold the most promise for having downstream, crossover effects on youth suicide risk. Using SEL programs as one example to illustrate this point, Fig. 1 shows

how an elementary school SEL program could have unanticipated benefits for reducing later STB. We will assume that the evidence-based SEL program has its intended impact on improving students' ability to regulate their emotions when faced with stressful situations. Meta-analysis shows that these impacts can be observed years later, into adolescence (e.g., middle school) (Taylor et al., 2017). Because emotion regulation skills deficits are thought to be central to youth STB risk (Miller & Prinstein, 2019)—and in fact are the primary target of evidence-based treatments for youth with STB (Asarnow et al., 2021)—we would then expect those strong emotion regulation skills developed through SEL programming in elementary school to ultimately result in lower risk for STB in later years.

Next, we summarize the state of the science on three common types of school-based programs that target some of these same factors and mechanisms: (1) SEL programs, (2) substance use prevention programs, and (3) cultural affirmation programs designed to enhance a sense of cultural pride and belonging for marginalized youth. Because “upstream” prevention is likely to yield the most widespread and cost-effective benefits for youth and schools (National Institute on Drug Abuse, 2016; Robertson et al., 2016; Substance Abuse and Mental Health Services Administration & Center for Substance Abuse Prevention, 2008), we do not cover clinical treatment interventions (e.g., cognitive behavioral or dialectical behavioral therapy). We also focus this review on school-based programs from pre-K through 12th grade. For a review of suicide prevention in the college setting, we refer readers to two other recent papers (Black et al., 2021; Wolitzky-Taylor et al., 2020).

Contemporary Theories of Suicide, Mechanisms of Risk, and Targets for Intervention

Suicide and suicide thoughts and behavior are rarely explained by one single factor and most contemporary theories of suicide acknowledge some interaction between one or more biological, environmental, social, and/or psychological factors. In a review of the research on youth suicide risk factors, Cha et al. (2018) found evidence supporting several risk factors for youth STB in the domains of demographic characteristics (e.g., age, gender), environmental factors,

psychological factors, and biological factors (Cha et al., 2018). Schools are most likely to be able to modify environmental and psychological risk factors, so we focus on those here. Cha et al.'s (2018) review found that psychological STB risk factors with moderate to strong evidence included feeling worthless, low self-esteem, hopelessness, lack of positive affect (anhedonia), emotion dysregulation and maladaptive coping, impulsivity, and loneliness/lack of social connectedness. Two environmental factors also demonstrated strong associations with youth STB: child maltreatment and bullying. One mechanism by which child maltreatment and bullying might impact the development of youth STB is through the aforementioned psychological factors (Cha et al., 2018; Miller et al., 2013). For example, youth who are abused by their caregivers or bullied by their peers may feel worthless, lonely, disconnected from their family and friends, and experience mental health symptoms and negative emotions like sadness, anger, and anxiety that are difficult to manage (Hertz et al., 2013; Miller et al., 2013).

Building upon the foundational review by Cha et al. (2018), school-based suicide prevention research and practice should also be guided by empirically supported theories about the mechanisms by which the aforementioned risk factors impact youth STB. In Table 1, we briefly describe risk factors and mechanisms of risk for some of the most common contemporary theories of suicide and highlight corresponding targets for preventive interventions. Where available, we highlight findings from applications of these theories to youth. Of note, none of the theories in the table below have been tested with children younger than 12 years old. While aspects of these theories may also apply to younger ages, additional work is needed to develop and test them.

As illustrated in Table 1, contemporary theories of suicide point to multiple pathways and differing mechanisms for suicide risk. Some mechanisms (e.g., lack of strong social connections combined with an event in which the individual perceives they are a burden to others leads to hopelessness and STB) may be more malleable than others (e.g., a combination of emotions and biological factors that interact to lead to vulnerability). Although all theories acknowledge the role of an individual's social and/or environmental context—either directly or through experienced stress—some frameworks give these elements more weight in ultimately contributing to STB. Indeed, theories that take into consideration cultural influences such as racism and stigma and the role they play

Fig. 1 Example of how existing programs could have crossover effects on youth suicide risk

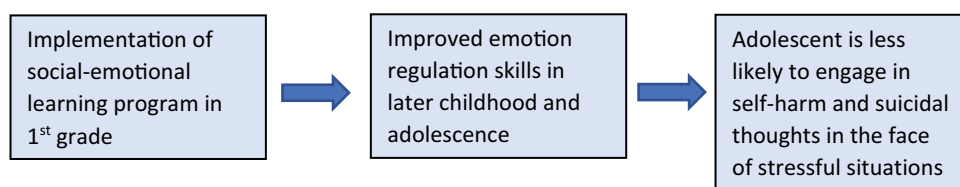


Table 1 Suicide theories, mechanisms of risk, and intervention targets

Name of theory	Mechanisms of suicide risk	Intervention targets	Research with youth
Interpersonal-psychological theory of suicidal behavior (IPTS) (Van Orden et al., 2008)	When individuals who feel disconnected from others or lack strong interpersonal relationships (i.e., thwarted belongingness) experience an event that makes them feel like they are a burden to others (i.e., perceived burdensomeness) they may exhibit suicidal thoughts and behaviors	Cultivating a sense of belonging Strengthening relationships with peers, family, other social groups (e.g., school staff)	Evidence for IPTS in adolescents not as strong as adult studies; central constructs of IPTS may hold in adolescents, though pathways are likely different (Stewart et al., 2017)
Acute stress response theory (Miller & Prinstein, 2019)	Individuals experience suicidal thoughts and behaviors when an event triggers acute stress and they are unable to dissipate or counteract that stress through biological responses	Strengthening coping skills/strategies	Period of adolescence creates a unique vulnerability due to coinciding of biological changes with increased interpersonal stressors (Miller & Prinstein, 2019)
Biosocial theory (Crowell et al., 2009; Linehan, 1993)	Individuals who have persistent and severe difficulty regulating their emotions (emotion dysregulation) employ suicidal thoughts and behaviors as a way to manage their emotions. Emotion dysregulation arises from a biological predisposition combined with an environment that negates or discredits an individual's emotions	Strengthening emotion regulation skills Strengthening coping skills/strategies Creating supportive environment	The interaction between biological vulnerabilities and an invalidating environment can lead to self-harm behavior as coping mechanism for youth (Crowell et al., 2009)
Cognitive-behavioral model of suicidality (Rudd, 2000)	When individuals who have difficulty managing emotions experience strong negative emotions (e.g., guilt, anxiety) in reaction to an event and these strong negative emotions combine with feelings such as unlovability, helplessness, and hopelessness, the “suicidal mode” can be triggered. The suicidal mode is a temporary crisis period in which an individual is consumed by the impulse to die and exhibits suicide planning behaviors	Strengthening coping skills/strategies	None found
Minority stress theory (Meyer, 2003)	Individuals who experience chronic social stress begin to constantly expect such stress and feel they must always remain on the lookout for triggers (e.g., discrimination, victimization). This constant vigilance combined with the internalization of negative societal attitudes can lead to an array of mental health problems, including suicidal thoughts and behaviors	Strengthening coping skills/strategies Promoting positive perception of self in context of minority identity Creating supportive environment	Minority stress experiences (e.g., discrimination, victimization) may heighten susceptibility to suicidal behavior in youth through their effect on more proximal risk factors (Polanco-Roman et al., 2021) (e.g., hopelessness, depression) and/or via cumulative exposure to multiple experiences (Green et al., 2021; Mustanski & Liu, 2013)

in STB are still relatively sparse (Chu et al., 2010). Also sparsely covered in the current suicide literature are studies that focus exclusively on protective factors and mechanisms even though such framing can help reduce stigma and point toward solutions. While most frameworks listed in Table 1 have been tested with youth, all but the acute stress response theory (Miller & Prinstein, 2019) were initially conceptualized using adult populations and may not adequately consider factors related to the unique developmental processes that occur during childhood and adolescence. Despite this complexity, there are many overlapping targets for suicide risk reduction across contemporary theories.

Common Types of School-Based Programs with Promise for Crossover Effects on Youth STB

As Table 1 demonstrates, there are common risk factors across contemporary suicide frameworks. Specifically, these theories point to three clear risk factors—the inability to regulate emotions, a lack of coping skills, and/or a lack of social connection/sense of belonging—that can lead to increased suicide risk when they interact with specific events or environmental or biological factors. In this section, we highlight some widely implemented school-based programs—SEL, substance use prevention, and cultural affirmation—that may have crossover effects on youth STB because they target these key risk factors and mechanisms. We also summarize their evidence of effectiveness relevant to youth STB.

Social Emotional Learning (SEL) Programs

SEL programs are designed to foster the development of five key competencies: self-awareness, self-management, social awareness, relationship skills, and responsible decision-making (CASEL, 2020). High-quality SEL instruction also seeks to establish a safe, caring environment and provide students opportunities to contribute to their class and school community, creating a sense of belonging. Within this overarching framework, there are a multitude of individual programs designed for different settings, age groups, and instructional approaches. Some of these programs have been assessed for outcomes but many have not. For example, the Collaborative for Academic, Social, and Emotional Learning (CASEL) maintains a Program Guide to Effective Social and Emotional Learning Programs, a *Consumer Reports* style publication designed to support schools in selecting SEL programs that fit their goals and students' needs (CASEL, 2022). To be included, programs must meet several criteria including written documentation of approach and at least one evaluation study with a comparison group. The 77 different programs included in the Guide represent

only a selection of SEL programs currently implemented in schools.

With the caveat that not all SEL programs are created equal, there is substantial evidence of their effectiveness in improving student outcomes. In their meta-analysis of findings from 213 universal, school-based SEL programs conducted between 1955 and 2007, Durlak and colleagues found that, compared to control students, students participating in SEL programs had improved skills and abilities related to emotion recognition, stress-management, empathy, problem-solving, and decision-making (Durlak et al., 2011). One notable limitation of the Durlak analysis is that the follow-up period for included studies was 6 months, leaving questions about the durability of these effects. A more recent meta-analysis by Taylor et al. (2017), looked at 82 school-based programs implemented between 1981 and 2014 and included studies with a mean follow-up period from 56 to 195 weeks (Taylor et al., 2017). The analysis included 7 outcomes of interest, among them social and emotional skills (e.g., identifying emotions, perspective taking, self-control, interpersonal problem-solving, conflict resolution and coping strategies, and decision-making) and attitudes toward self (e.g., self-efficacy, self-concept) and school (e.g., school bonding, connectedness, or belonging). While the effect sizes for these longer follow-up periods were diminished, the direction of the findings remained: students who participated in SEL programs had significantly improved social and emotional skills and attitudes toward self and school as compared to students who had not participated in these programs. In addition, Taylor and colleagues collapsed all 7 outcomes of interest into a single intervention level outcome and found that significant positive effects for SEL program participants were found across all demographic groups (including race and socio-economic status). While the existing evidence that SEL programs can improve many of the factors associated with attenuated suicide risk (e.g., emotion regulation, coping skills) is strong, to our knowledge, there have been no published studies that directly measure the effects of traditional, universal, school-based SEL programs on suicide outcomes. This represents a much-needed area for research.

Substance Use Prevention

Substance use elevates risk for youth STB, and substance use and STB share many risk factors such as impulsivity, emotion dysregulation, and maladaptive coping skills (Esposito-Smythers & Spirito, 2004; Lowry et al., 2014; Pompili et al., 2012). Therefore, substance use prevention programs that address these common risk factors or that effectively prevent substance use may have beneficial crossover effects on youth STB (Wyman, 2014).

Substance use prevention is a common element of public-school curricula in the USA, with most states having requirements or standards for school-based substance use prevention (Bruckner et al., 2014). Reviews of school-based substance use prevention programs suggest that their outcomes are somewhat mixed, where universal prevention and early intervention approaches in elementary and middle school appear to have relatively modest and short-term effectiveness in preventing substance use (Benningfield et al., 2015; Hopfer et al., 2010). These programs typically teach children about substance use and its negative consequences and work on changing perceptions about the acceptability and prevalence of substance use (i.e., norms) (Benningfield et al., 2015; Hopfer et al., 2010). Early, elementary school substance use prevention often focuses more specifically on strengthening skills that can protect youth from substance use later in life, such as inhibitory control, coping skills, and self-esteem (Benningfield et al., 2015; Hopfer et al., 2010; Onrust et al., 2016). As noted previously in this paper, researchers found that the Good Behavior Game, a universal elementary school program that is effective in preventing substance use and risky behaviors (Kellam et al., 2014), also reduces STB in young adulthood (Wilcox et al., 2008). Results showed that peer social preference partially mediated the relationship between the GBG and the associated reduction of risk for later suicide attempts by adulthood (by 22–30 years), specifically among children characterized by their first grade teacher as highly aggressive and/or disruptive (Newcomer et al., 2016).

Examination of the impact of substance use prevention programs on youth STB is an area in need of much further research, including research to explore the mechanisms by which such programs may simultaneously reduce both substance use and STB risk in youth.

Cultural Affirmation Programs

Much of the empirical and theoretical literature emphasizes the importance of belonging, social connection, cultural identity, and self-esteem as protective factors for STB and mental health (Meyer, 2003; Polanco-Roman et al., 2021; Whitlock et al., 2014). Supporting this is research showing that “acculturative stress” (Berry, 1998) defined as “stress related to adapting to the beliefs, practices and values of a dominant culture” (p. 1466 in Gomez et al., 2011) (which may be hostile to or unaccepting of minority racial and ethnic and sexual and gender identities) is related to an increased risk for STB (Gomez et al., 2011). Indeed, the groups of youth at highest risk for STB are often those who have been marginalized. For example, concerning trends show that sexual minority, American Indian/Alaska Native (AI/AN), Black, and Asian/Pacific Islander youth are increasingly vulnerable to STB (Lindsey et al., 2019; Marshal et al., 2011; Ramchand et al., 2021; Russell & Fish, 2016; Sheftall et al.,

2021). Intersectionality research shows that youth with multiple minority identities (e.g., Black and American Indian bisexual youth) may be at particularly high risk for certain types of STB (Baiden et al., 2020). For example, using data from the Youth Risk Behavior Surveillance System (YRBS), Baiden et al. (2020) found that youth who were SGM as well as racial and ethnic minorities were more likely to report suicide attempts but less likely to report suicidal ideation compared to youth who were White and/or not SGM. In this section, we focus on the promise of school-based cultural affirmation programs for SGM and racial and ethnic minority youth separately because this reflects how research and practice have conceptualized each aspect of identity until recently. However, we acknowledge that this is a limited approach given the importance of considering intersectionality.

Sexual and Gender Minority Youth

In reviewing the literature, Postuvan et al. (2019) concluded that unaccepting school and other social environments increase STB risk for SGM youth (Postuvan et al., 2019). They recommended that suicide prevention for SGM youth take this into account, for instance, by focusing on changing school climates to be more accepting of SGM identities. Studies have found the presence of Gay-Straight Alliances (GSAs) protect SGM youth from suicide-related risk factors like peer victimization and mental health problems (Marx & Kettrey, 2016). However, recent research suggests that GSA presence could be just one proxy for school climate and SGM identity-affirming school staff (Colvin et al., 2019). When supportive school climate and supportive school personnel are more comprehensively and directly measured, the presence of a GSA was no longer associated with youth mental health (Colvin et al., 2019). Cross-sectional evidence suggests that a sense of school belonging, and a supportive school climate may be protective for SGM youth suicidality (Hatchel et al., 2019), but longitudinal research is lacking. Thus, it is not yet clear whether supportive, programs that enhance support and belonging among SGM youth could have direct impacts on STB.

Racial and Ethnic Minority Youth

Similar patterns have emerged among racial and ethnic minority youth, where racial and ethnic affirmation and acceptance in school and at home is related to youth self-esteem, feelings of belonging, and academic outcomes (Dee & Penner, 2017; Hernandez et al., 2014; Hughes et al., 2009). For example, according to the Indian Health Service, factors that protect AI/AN youth and young adults against suicidal behavior are a sense of belonging to one's culture, a strong tribal/spiritual bond, the opportunity to discuss problems with family or

friends, feeling connected to family, and positive emotional health (Indian Health Service, 2022).

Loyd and Williams (2017) presented a conceptual framework to consider ways that youth programs—including school-based programs—can improve ethnic-racial identity (Loyd & Williams, 2017). They posit that critical components include several common to the STB prevention literature, such as the improvement of interpersonal interactions, coping, and self-esteem. A recent systematic review found promising evidence for the effectiveness of culturally affirming African-centered interventions on Black youth self-concept, behaviors, cultural identity, and academic achievement (Lateef et al., 2022). However, similar to a review on culturally sensitive interventions for Native American youth (Jackson & Hodge, 2010), the authors concluded that additional, more rigorous research is needed to measure the extent to which such approaches improve different aspects of youth wellbeing. Further, to our knowledge, these programs have not been examined for their downstream or crossover effects on youth STB. One example of a school-based culturally affirming program is Brothers of Ujima (Belgrave et al., 2011; Graves & Aston, 2018), a 14-week, culturally responsive program for African American boys with goals to improve self-esteem, ethnic identity, and prosocial behavior. Initial evidence from a pilot study in 6th and 7th graders found statistically significant improvement from pre- to post-intervention in Afrocentric values but did not find evidence of improvement in resiliency or racial identity. However, this was a small pilot study with no control/comparison group and measures of suicide risk were not included. While we are not aware of any past studies that have examined the impact of school-based, culturally affirming programs for racial and ethnic minority youth on STB, it is a promising area for exploration in the future.

Discussion

With youth mental health problems causing alarm across the USA, schools are being recognized as key players in the prevention of youth suicide. However, school-based programs focused specifically on suicide prevention are challenging to study and have shown little impact on youth STB to date, partly because such studies require longer term follow up periods (e.g., into adolescence or young adulthood) (Singer et al., 2019). Furthermore, ever-increasing demand on schools to address a multitude of child and family concerns underscores a pressing need to identify school-based programs and initiatives that can efficiently address multiple problems at once. In this paper, we used theoretical and empirical evidence to highlight key youth STB protective factors as well as risk factors and mechanisms that may already be the focus of ubiquitous school-based programs

and which therefore have the potential to reduce STB risk downstream. SEL, substance use prevention, and cultural affirmation programs are examples of widely implemented school-based programs that hold promise in preventing STB. While little research has been conducted to investigate whether this is the case, this brief review and summary shows that there is a theoretical, mechanistic, and empirical grounding upon which researchers can build such studies. Because these programs are so widely implemented, researchers have an opportunity to conduct more fully powered studies using the large samples needed to investigate youth STB outcomes like suicide attempts which can be rare in smaller community samples. Should these different programs demonstrate an impact on STB, schools and policymakers could save resources by focusing on bolstering and sustaining these existing programs rather than launching new, non-evidence-based ones. As noted above, attempts to be consistent in our definitions of terms like “risk factor,” “mechanism,” and “protective factor” will augment the interpretability and, ultimately, the impact of this work. In addition, insufficient attention has been paid to protective factors in the literature, and some factors—such as coping skills—are cited as conveying risk and protection without further distinction (e.g., lack of coping skills is considered a risk factor while strong coping skills are protective). Research that focuses primarily on protective factors and mechanisms may be a fruitful way to advance suicide prevention research and turn the focus toward strengths rather than weaknesses.

This paper is intended to provide a framework to help researchers, practitioners, and policymakers as they consider how to prevent youth suicide using existing school-based resources effectively and efficiently. However, our approach comes with limitations. Namely, this was not a systematic review of the literature; there may be other school-based programs that hold promise for preventing suicide not covered here. We focused on reviewing interventions that did not target STB directly but did address youth suicide risk and protective factors. We did not review clinical interventions that specifically address ways to manage STBs in individual youths. Schools will continue to need to address urgent cases of suicide risk since broader prevention efforts will not prevent all instances of acute STB (Substance Abuse & Mental Health Services Administration, 2020). In addition, we recognize the recent media coverage of some communities calling into question the appropriateness of schools to address the mental health needs of students. In addition, some states have begun to prohibit schools from discussing racial and ethnic identity, sexual and gender identity, and the discrimination experienced by individuals with minority racial and ethnic and sexual and gender identities (e.g., [Florida House Bill 1557 of 2022](#); [Texas Senate Bill 3 of 2021](#)). These policies may impact the ability of many schools and researchers to implement and

evaluate SEL and cultural affirmation programs. However, current trends in risk for youth suicide and the need for evidence-based approaches underscore the importance of rigorous studies to determine whether existing school-based programs have an impact (whether beneficial, as we hypothesize, or harmful) on youth STB. This type of research can inform policymakers of the potential for unanticipated consequences (harms and benefits) of laws that limit vs. expand the availability of SEL, cultural affirmation, and other programs.

Amid converging health and mental health crises, schools face a building pressure to address youth suicide risk as they simultaneously face staff shortages, burnout, and a myriad of competing demands (Diliberti & Schwartz, 2022). It is possible that programs schools are already implementing may, in fact, have crossover effects on suicide prevention even when these programs are not specifically designed to address STBs. Researchers can support schools by examining whether existing school-based programs that target emotional and behavioral problems that share risk factors with youth suicide are already having an impact on youth STB. In some cases, these studies could leverage existing data to answer key questions, further enhancing their efficiency. In other cases, new measures and assessments would be needed. For example, researchers who have access to data from a prior study of, say, an elementary school SEL program could conduct a follow-up with those participants to assess STB later in childhood, adolescence, or even adulthood. Consistent with the NIMH's focus on experimental therapeutics (Gordon, 2017), these studies could also examine whether change in the original program targets (e.g., emotion regulation skills) mediate or partially explain outcomes. Because youth STBs are uncommon and therefore require larger sample sizes, integrating data sets from multiple school-based studies of the same intervention may be advantageous (Wilcox et al., 2016). In addition to consideration of unanticipated benefits for STB outcomes, it will also be important for such research to examine whether school-based programs have any unintended harms. While we emphasize that there is no evidence to suggest that such harms would occur, objective and valid measurement of the feared and imagined harms (based on recent uproar and controversy over certain school-based programs [e.g., SEL, cultural affirmation]) would strengthen schools' abilities to respond to such criticisms. Rigorous investigation of existing, promising school-based approaches, such as the ones covered in this paper, is urgently needed to advance evidence-based suicide prevention in schools.

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Declarations

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Consent to Participate Not applicable

Conflict of Interest The authors declare no competing interests.

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