Suicide and the Role of Educational Institutions: A 30-Year Systematic Review

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Abstract

Suicide is the second leading cause of death in the 15–29 age group worldwide, and is a severe public health problem worldwide. Adolescent and young adult individuals primarily attend educational institutions which can play an essential role in detecting and preventing suicide. For this reason, the purpose of this research is to examine the role that educational institutions play in suicide prevention. A systematic review was conducted to determine what educational institutions and agents are identified in the literature when addressing suicide. The systematic review yielded 58 articles published over the last 30 years. The results show that a wide variety of educational stakeholders are required to intervene for suicide prevention between primary education and college. Overall, educational suicide initiatives report positive effects on participants' understanding, attitudes, and beliefs regarding suicide and suicide prevention, although some studies have expressed some caution. The different types of programs and recommendations are discussed.

Introduction

According to the World Health Organization ([WHO], 2020), depression and suicide among adolescents constitutes a global challenge. Worldwide, suicide is the third leading cause of death in 15-to 19-year-olds and is the predominant external cause of death among this age group in Spain. Therefore, suicide prevention among children and adolescents is a high priority. Moreover, in many countries and regions, most people in this age group attend school. Thus, it has been suggested that preventive actions must be taken in educational settings (Cox et al., 2016; WHO, 2020). Schools provide a unique environment in which to identify and respond to youth suicide risk (Singer, 2017). Nevertheless, while schools may contribute to suicide prevention, they may also exacerbate the problem.

The present research intended to examine the role that educational institutions play in suicide prevention. The most significant increase in the risk of suicidal ideation, planning, or intent occurs in the second decade of life. Therefore, it is important to determine what role educational institutions may or should play in suicide prevention and to identify whether the literature has made sufficient recommendations for educational policy makers.

Schools must be incorporated into the analysis to elucidate the conditions in which young people contemplate and/or plan to inflict lethal self-harm, particularly regarding bullying experiences (Kim & Chun, 2020). A triangular correlation has been found between school bullying, quality of life, and suicidality (Chen, et al., 2020). Compared with other children with behavioral problems, those who experience school bullying and have mild to severe psychological problems are more likely to engage in non-suicidal self-injury behaviors (Li et al., 2020).

Minority experiences in schools must also be carefully considered. Students who perceive more public stigma may report significantly greater odds of experiencing suicidal ideation, planning, and attempts (Goodwill & Zhou, 2020). For example, African American youth, who are often understudied and underrepresented in validation samples, are also at considerable risk of suicidal behaviors and should not be ignored by researchers and practitioners (Brown & Grumet, 2009). Young queer people, and specifically young queer blacks, have disproportionately experienced suicidal ideations compared with their school peers (Lardier et al., 2020). School-based health centers may help reduce mental health disparities among young people from sexual minorities: a marginalized, underserved population (Zhang et al., 2020).

Regarding educational institutions working with young adults, it is striking that various studies have focused on the poor mental health of college students. Over a quarter of the college participants in studies on suicide have poor mental health, have experienced stress, are subject to suicide ideation and/or are at risk of suicide (Abdu et al., 2020; Akram et al., 2020; Chen et al., 2020; Davis et al., 2020; Ross et al., 2017). Gender- and race/ethnicity-specific suicide prevention strategies are needed for college students, specifically men and racial/ethnic minority groups (Sa et al., 2020). There are significant differences between racial and ethnic groups of college students with suicidal ideation regarding perceived barriers to seeking treatment. (Samlan et al., 2021). It is essential to understand the reasons for the rise in suicide rates among young people (Gunnell et al., 2020). Prevention and coping actions are needed to reduce the burden of suicide (Abdu et al., 2020; Flores et al., 2020; Kinchin et al., 2020; Kodish et al., 2020; Ross et al., 2017). Likewise, universally focused suicide prevention programs should be introduced early in school-based settings. Interventions should be tailored to reach high-risk students with language, cultural, and social integration challenges (Flores et al., 2020) and help develop cognitive behavior to improve suicidal thoughts and build dispositional hope and goal-directed thinking (Li et al., 2020). Addressing the problem of youth suicide requires collaborative and synergistic action across various community institutions and agencies (Breux & Boccio, 2019).

Method

A systematic review was conducted to determine what educational institutions and agents are identified in the literature as having a role in addressing suicide. In the words of Grant and Booth, the method used in this article was aimed at “gathering research, getting rid of rubbish and summarizing the best of what remains” (Brown & Grumet, 2009; Grant & Booth, 2009; Hart, 1998; National Institutes for Health, 2019).

Research Questions, Objective, and Hypothesis

The research team gathered the following specific research questions that embodied scientific motivation:

1. What educational institutions have been identified in the literature as settings for suicide prevention and why?
2. What agents in the educational field have been described in the literature as having a positive impact on suicide prevention?

Based on these research questions, the authors set the main objective of this study, which was to examine the role of education institutions in suicide prevention. The study also aimed to inform both the research community and policymakers on how to address future research questions and revise educational policies on suicide prevention. Based on the literature, our hypothesis was that the literature would identify the educational stakeholders who should play a role in suicide prevention, intervention, and postvention; and offer recommendations that may guide educational stakeholders when approaching suicide prevention, intervention, and postvention in educational settings.

Search Process and Selection Criteria

The search strategies were defined in discussions held by the authors. The search terms were determined based on keywords identified in preliminary searches: TITLE: (suici* near/5 education) OR TITLE: (suici* near/5 school*) OR TITLE: (suici* near/5 university) OR TITLE: (suici* near/5 teacher*) OR TITLE: (suici* near/5 student*) OR TITLE: (suici* near/5 educator*). The authors searched the WOS, CCC, DIIDW, KJD, MEDLINE, RSCI, and SCIELO databases. We also examined only those articles published between 1990 and 2020, thus covering three decades of research on suicide prevention.

Inclusion Criteria

The studies selected to be included in this review had to specifically relate to suicide prevention, intervention, or postvention in an educational setting. Moreover, the studies had to describe and/or assess an educational intervention specifically designed: For suicide prevention, intervention, and postvention; to raise awareness of suicide-related themes; to identify and/or support at-risk groups; to promote suicide protective factors; to offer first aid in a suicide-related emergency; and to address postvention. Finally, the studies had to have been published in a peer-reviewed journal between 1990 and 2020.

Exclusion Criteria

Studies were excluded from the review if they did not specifically address educational aspects of suicide prevention, were not published in a peer-reviewed journal, or contained no unique relevant data about the inclusion criteria.

Procedure

The search strategy described above retrieved 1107 items, which were downloaded to Endnote. After duplicate items were removed, 1103 articles remained. The authors then conducted a pilot study in which they analyzed 10% of the corpus and refined the inclusion and exclusion criteria. After this pilot stage, the 1103 article titles and abstracts retrieved were systematically screened by three of the co-authors in an initial process to select and remove items by applying the refined inclusion and exclusion criteria. The extraction of data from all relevant papers was completed at this point using an online Excel document shared by the authors. Research meetings were held to discuss questionable items. Seventy-four articles were selected by two or three researchers to make up the corpus of the second stage of the analysis. This was reduced to a final corpus of 58 articles after the inclusion and exclusion criteria were revised, this time after reading the full manuscripts. The 58 papers in the final corpus were finally uploaded to the software Atlas and coded for: type of educational institution (e.g., school, university, others); agents (e.g., teachers, school directors, parents, social educators, policy makers); agents' skills and knowledge (e.g., suicide risk and protective factors, crisis management); research objectives pursued; recommendations for educational stakeholders; and future research directions suggested. Figure 1 shows the procedure for applying the PRISMA criteria (PRISMA, 2015).

Results

Fifty-eight studies published between 1990 and 2020 described and/or assessed an educational intervention on suicide prevention, intervention, or postvention. Table 1 summarizes the various methodological approaches

used by researchers to pursue their objectives. Of the 58 studies, 44 (75.86%) used quantitative methods, 10 (17.24%) used qualitative methods, and 2 (3.44%) used a mixed-method approach. The methodology applied in 2 (3.44%) of the studies was not clearly described. Thirty-four programs designed to approach suicide prevention (30), intervention (3), or postvention (2) in educational settings were described and/or assessed in the literature. Table 2 presents the list of programs identified, a brief description of the programs, and the study in which they appear. The educational settings addressed by the studies ranged from primary school to college. Table 3 classifies the studies in terms of the suicide phase and educational setting.

The literature identifies various agents that play a role in suicide prevention, intervention, and postvention. Tierney et al. (1990) contend that every major stakeholder group in the school system, including board members, administrators, professional staff, support staff, parents, and students, should participate (Tierney et al., 1990). Similarly, other authors have called for the whole school community to take responsibility for addressing suicide in educational contexts (Cox et al., 2016; Gijzen et al., 2018; Maples et al., 2005; Roberts et al., 2018; Ryerson, 1990; Shannonhouse et al., 2017; Tompkins et al., 2010).

In the primary school context, Roberts et al. (2018) identified agents such as teachers, psychologists, counselors, and parents. In secondary and high school contexts, the literature identified a wide range of agents who should intervene in the fight against suicide: teachers, school guidance counselors, school nurses, parents, school-based mental health professionals, such as school counselors, social workers, and school psychologists and adolescents themselves.Various agents were identified as having a role in suicide prevention, intervention, and postvention initiatives in college: college students, student organization representatives, living-on-campus administration staff, student affairs staff and administrators, parents and family members, college counselors, college psychologists , college faculty and staff and trained facilitators, clinical professionals who can evaluate mental health problems, campus ministers, university police officers, public safety, and transportation personnel and tribal leadership in the case of suicide attempts in American Indian communities.

Regarding geographical distribution, of the studies that analyzed data from a single country, 35, 5, 2, and 2 were conducted in the United States, Australia, Canada, and Italy, respectively. One study came from each of the following countries: Brazil, Chile, Germany, Korea, Hong Kong, Kenya, Puerto Rico, Japan, and the Netherlands. Five studies analyzed data from more than one country. Wasserman et al. (2015), Kahn et al. (2020), and Ahern et al. (2018) analyzed data from 10 European countries: Austria, Estonia, France, Germany, Hungary, Ireland, Italy, Romania, Slovenia, and Spain. Han et al. (2018) analyzed data from China and Australia. Cox et al. (2016) analyzed data from Australia, New Zealand, and the United States. Figure 2 shows the data.

Assessment of Suicide Educational Programs

Overall, the programs were described as safe (Robinson et al., 2015), contributing to school safety (Breux & Boccio, 2019), and feasible to implement within a school setting (Kinchin et al., 2020). Educational initiatives addressing suicide had a positive impact on participants' levels of knowledge, attitudes, and beliefs regarding suicide and suicide prevention (Chaniang et al., 2019, 2019; Coleman et al., 2019; Cramer et al., 2019; Flynn et al., 2016; Indelicato et al., 2011; Kalafat & Elias, 1994; Roberts et al., 2018; Schilling et al., 2014; Schmidt et al., 2015; Tompkins et al., 2010; Totura et al., 2019; Yousuf et al., 2013). Testoni et al. (2020) reported that participants who received education about death showed improvements in the positive meaning of life and

reduced anxiety. Additionally, they identified improvements in students' ability to recognize emotions and communicate them verbally (Testoni et al., 2020). Ryerson (1990) reported an increase in the number of referrals to the local mental health provider, less resistance to asking for help, improved communication, enhanced trust between students and suicide prevention program personnel, and a decrease in the number of suicides in participating school systems (Ryerson, 1990). Zenere and Lazarus (2009) and Wasserman et al. (2015) found that comprehensive school-based suicide prevention programs reduced youth suicidal behavior. Conforti et al. (2020) showed that a teacher-delivered cognitive behavior therapy skills curriculum was feasible and associated with reduced suicidality (ideation and behavior) in middle school-aged youth. Breux and Boccio (2019) provided preliminary evidence on the effectiveness of suicide educational programs. The programs improved participants' attitudes toward the importance of school-based suicide prevention, understanding of best practices, perceptions of administrative support, and feelings of empowerment to work collaboratively and enhance their schools' suicide safety. Educational stakeholders who received training in suicide prevention reported feeling more comfortable, competent, and confident in intervening with a person at risk of suicide (Brown et al., 2018; Cimini et al., 2014; Hashimoto et al., 2016; Johnson & Parsons, 2012; Muehlenkamp et al., 2009; Shannonhouse et al., 2017; Stewart et al., 2020).

Some negative outcomes of educational suicide interventions were also reported in the literature. Fendrich et al. (2000) showed that the unsolicited mass distribution of information and materials related to suicide and violence prevention is of limited usefulness. Maples (2005) described the corrections made to a suicide crisis management intervention to avoid romanticizing suicide. Callahan (1996) described how a sense of "specialness" and secrecy served to heighten students' sense of melodrama over a school mate's suicide, which also furthered the spread of suicide. However, when he altered the postvention activities to avoid the atmosphere of romantic tragedy, such as reporting every expression of student suicide ideation to parents regardless of the level of severity, suicidal ideation decreased. In fact, this communication with parents was helpful because it focused attention on parent-child conflicts, thus making it possible to solve family issues that, in some cases, were contributing to suicidal ideation. Roberts et al. (2018) pointed out the importance of offering primary school teachers coaching and support, in addition to regular training for addressing suicide. An in-depth qualitative study by White and Morris (2010) showed that teachers might feel insecure about approaching the subject of suicide with students and use fact-based information without giving students the opportunity to conceptualize suicide as a social historical phenomenon. White and Morris (2010) warned that there might be unexpected and sometimes unwanted learning during suicide educational initiatives. Breux and Boccio (2019) cautioned that insufficient time, and stigma surrounding the topic of suicide, are barriers to implementing changes after educational interventions. Han et al. (2018) reported that the program had a short-term positive influence on participants' suicide literacy, although it was not sufficient to change students' attitudes or intentions to seek help. Finally, the effects of gatekeeper suicide prevention training over time have been found to be unsustainable in studies that incorporated a follow-up step in their methodology (Brown et al., 2018; Cimini et al., 2014).

The literature presents numerous recommendations based on the implementation and assessment of educational interventions for suicide. Willson et al. (2020) pointed out the need to continue addressing biases and stigma surrounding suicide. Tompkins et al. (2010) advised educational communities to come together to talk about suicide prevention, identify weaknesses, build on strengths, and create plans of action.

Wasserman et al. (2015) stressed a need for the large-scale implementation of universal school-based suicide prevention programs. Ryerson (1990) recommended that extensive research into the target educational context and student population should be conducted before initiating a suicide educational program, and that as many key players as possible should be involved in the tailoring process. Tierney et al. (1990) stated that a suicide prevention program must be based on a system-wide policy and address all aspects of suicide: prevention, intervention, and postvention. Tierney et al. (1990) recommended the creation of comprehensive programs that require coordination and networking components, along with implementation commitments from every major stakeholder group in the school system. These included board members, administrators, professional staff, support staff, parents, and students.

Shannonhouse et al. (2017) stated that training is needed in school settings to respond to young people at risk of suicide. School counselors should be trained in suicide intervention skills to build the capacity of their school community and provide suicide first aid to students in need. Cox et al. (2016) recommended that school staff should not use the terms 'committed suicide' or 'successful suicide' when discussing a death, because the word 'committed' is associated with an illegal or criminal act, and 'successful' implies that the individual reached a desirable outcome. Johnson and Parsons (2012) and Shannonhouse et al. (2017) recommended that suicide should be a training priority for school staff. Every front-line staff member should know how to intervene with potentially lifesaving responses (Johnson & Parsons, 2012). Similarly, Brown et al. (2018) recommended gatekeeper workshops as school staff are important gatekeepers in preventing adolescent suicide.

However, Roberts et al. (2018) warned that teacher training alone is insufficient to ensure that teachers impart mental health promotion strategies to their pupils. They argued that teachers also need ongoing support and coaching throughout the school year if their students are to learn and integrate mental health strategies. With appropriate guidance and support, schools can be integrated into the tapestry of social institutions working to reduce the loss of young life to a preventable public health problem (Breux & Boccio, 2019).

Additionally, isolated training sessions are not recommended. Various studies highlight the value of periodic suicide prevention training, and exposure to a variety of models to provide or reinforce corrective educational and practical experience (Indelicato et al., 2011; Kalafat & Elias, 1994; King & Smith, 2000; LaFromboise & Lewis, 2008). Johnson and Parsons (2012) recommended updating knowledge and skills training to mitigate erosion in confidence and increase the likelihood of effective intervention. Cimini et al. (2014) recommended booster training sessions to address skill degradation over time.

Stein et al. (2010) suggested that suicide prevention training should educate school personnel about the key components of guideline-based suicide prevention services, including information about confidentiality. The training should also suggest alternative strategies to respond to unique educational context needs, populations, and institutional resources. Roberts et al. (2018) additionally suggested that each audience member should take a pretest prior to each suicide prevention educational session to assess pre-existing knowledge levels.

Schmidt et al. (2015) proposed that educational suicide prevention efforts in schools should also focus on issues such as family problems, grief, or loss, and being bullied as factors associated with suicidal thoughts. Biddle et al. (2014) further suggested psychological autopsies for all adolescents who died by suicide. Pickering et al. (2018) recommended peer-led interventions as an important complement to other intervention strategies targeting higher-risk youth. According to Cimini et al. (2014), implementing audience-specific gatekeeper training

programs can be beneficial. Brown and Grumet (2009) contended that when considering screening for mental health issues in schools, the ability to follow up with at-risk youth is essential. They further stated that it is essential for positively screened young people to be linked to some additional evaluation or treatment, and that this should not be decided solely by the parents. Cha et al. (2018) warned that having a crisis protocol intervention when a peer suicide occurs helps to improve trauma-related symptoms and might be an effective way to prevent suicide spreading among students by alleviating such trauma-related symptoms.

Additionally, White and Morris (2010) highlighted the complexity of suicide as a culturally situated phenomenon. They argued against conceptualizing suicide through singular, stable, or universalizing terms that transcend time and context. They also claim that several factors contradict the overall aims of youth suicide prevention. These include expecting educators to rely exclusively on narrow “evidence-based” curricula that authorizes expert knowledge and precludes all other knowledge, locate problems within people, dismiss any uncertainty or ambiguity, inhibit local and relational meaning-making, and stifle creativity by rigidly adhering to pre-specified and “safe” learning outcomes.

Regarding recommendations made specifically for young adults, Fernandes et al. (2020) discussed the importance of developing projects for the university community. Given the need to discuss and reflect on suicide prevention, they recommend that these projects be integrated with the health network and student support services of educational institutions. Chugani et al. (2020) recommended that campuses that can invest additional resources in student mental health and suicidality should focus on primary prevention, such as increasing coping skills and resilience. Rivero et al. (2014) suggested that campus staff should consider the array of policies, programmatic infrastructures, on- and off-campus mental health, and other support resources that can be mobilized so that each student can be managed according to their needs.

If a suicide occurs, Mintz-Binder (2007) points out that faculty and staff involved in teaching should neither be expected to handle these events alone, nor be made to feel responsible. They urge educational institutions to have a well-rehearsed plan established before sudden events occur. This can help to minimize the shock and denial responses to a traumatic situation and allows for an organized systematic approach to be implemented.

The literature review also identified recommendations regarding the dissemination of materials related to suicide. Fendrich et al. (2000) warned that when unsolicited materials are sent to schools, the most appropriate school contact person should be identified in advance. Their experience shows that distribution to the right contact person, especially when preceded by personal contact through telephone calls, is more likely to result in effective dissemination than a mass-mailing approach. Indelicato et al. (2011) and Han et al. (2018) also recommended that future suicide prevention intervention programs for university students should consider an online approach, as students generally favor it.

Finally, recommendations have been made on interventions within tribal communities (LaFromboise & Lewis, 2008). Lafromboise and Lewis (2008) strongly recommended that these interventions include protocols associated with cultural resources, indigenous values, and healing practices. They suggested that researchers should seek guidance from tribal/community leaders to develop and apply such interventions. If interventions are to be conducted effectively, researchers must intervene in the most professional and culturally competent manner possible (LaFromboise & Lewis, 2008).

Discussion

The main objective of the present study was to examine the role of educational institutions in suicide prevention and to inform both researchers and policymakers on how to address future research and educational policies on this issue. The systematic review yielded 58 articles published in the last 30 years that met the inclusion and exclusion criteria. A high percentage of these studies used quantitative methodology to reach their objectives (75.86%), which is useful for objectively assessing the viability and effectiveness of the different programs. However, more qualitative or mixed studies are also needed to analyze aspects that are not possible to assess or identify with quantitative procedures. Regarding the geographical distribution of the studies, the vast majority were carried out in the United States. This result coincides with other systematic reviews in other contexts (for example, with emergency services employees) (Witt et al., 2017); thus, considerably more studies are needed in other countries and cultures. According to the WHO (2021), suicide rates vary considerably between countries, which suggests that sociocultural variables may explain suicidal behavior to some extent. Goldston et al. (2008) contend that consideration should be given to cultural patterns related to suicide, such as the kind of triggers or precipitants of suicidal behavior, the reactions to and interpretations of suicidal behaviors, or the search for help, which may vary across cultures. Furthermore, risk and protective factors for suicidal behavior may also be influenced by cultural context (Goldston et al., 2008). For this reason, research must focus on interventions in different cultural contexts and countries, because some programs may be more appropriate in specific settings. It is also important to develop programs based on cultural characteristics and assess their effectiveness. The shortage of culturally sensitive prevention programs for educational contexts is a limitation that may generate economic and human costs.

Most studies focus specifically on suicide prevention, particularly in secondary and high schools. The focus on intervention and postvention efforts in the aftermath of suicide acts is less prominent. Therefore, more studies are needed on the development and assessment of intervention and postvention programs in the educational context. In fact, Tierney et al. (1990) pointed out that programs to reduce suicidal behavior should address all aspects of suicide, including prevention, intervention, and postvention. Furthermore, one positive outcome of the current review is that it has identified a wide range of stakeholders at different educational levels, including students, teachers, counselors, families, psychologists, administrators, and staff. However, some programs are not designed for the entire educational community, a limitation that several authors have pointed out needs to be redressed (Berk & Adrian, 2018; Gijzen et al., 2018; Maples et al., 2005; Ryerson, 1990; Shannonhouse et al., 2017; Tompkins et al., 2010). This can be achieved by developing comprehensive programs that facilitate the commitment of different stakeholders and the coordination between them (Tierney et al., 1990).

Most suicide educational programs are effective in terms of changing students' understanding, knowledge, perceptions, and attitudes (Chaniang et al., 2019; Coleman et al., 2019; Kalafat & Elias, 1994; Tompkins et al., 2010; Totura et al., 2019). More specifically, those who attended suicide educational interventions were reportedly more knowledgeable about suicide prevention after the educational sessions and had more helpful attitudes or beliefs about suicide. However, Han et al. (2018) suggested that improved understanding in the short term does not necessarily change the intention to seek help when experiencing suicidal ideation, which may limit the real impact of programs that only assess changes in students' understanding. The work by Zenere and Lazarus (2009), Wasserman et al. (2015), and Conforti et al. (2020) suggested that suicidal ideation and behavior were reduced. Of the 58 studies analyzed, only four reported attendees actually practicing their new

abilities. Johnson and Parsons (2012) reported that within three months of training, one staff member reported using the Question, Persuade, and Refer (QPR) response with a suicidal student. Stewart et al. (2020) stated that two-thirds of the clinical staff who attended training implemented suicide prevention initiatives at least once. Coleman et al. (2019) reported a medium-sized increase in the number of peers referred to mental health services by participants in an educational suicide initiative. Hashimoto et al. (2016) mentioned that one-third of participants had one or more opportunities to use their suicidal student management skills within a month. None of these cases assessed how attendees of educational suicide initiatives had changed their practice using their new suicidal student management skills. Much more evidence is needed on the long-term impact of prevention, intervention, and postvention programs, and whether they lead to deeper changes in students, which effectively reduces suicidal behavior in the long term. Moreover, according to Roberts et al. (2018), the assessment of prevention programs should include a comparison between a pre-test, before the implementation of the program, and a post-test after the program, to determine whether there have been any changes.

Several recommendations have been made by the authors of these studies. These included the need for school staff and counsellors to be trained (Johnson & Parsons, 2012; Shannonhouse et al., 2017); to address biases and stigma about suicide (Willson et al., 2020); to provide guidance, support and coaching to teachers on mental health strategies (Roberts et al., 2018); and to implement prevention programs periodically to increase their impact (Indelicato et al., 2011; Kalafat & Elias, 1994; King & Smith, 2000; LaFromboise & Lewis, 2008). Studies also highlighted the need for these programs to address issues that may have a negative impact on the mental health of students, such as bullying, family problems, etc. (Schmidt et al., 2015); to follow-up at-risk students (Brown & Grumet, 2009), or the need for educational institutions to have a crisis protocol intervention to minimize negative reactions to a peer suicide or a sudden event (Cha et al., 2018; Mintz-Binder, 2007).

Conclusion

In summary, the current systematic review provides an overview of the prevention, intervention, and postvention programs carried out in educational institutions to reduce suicidal manifestations and shows the state of current practice. The study describes the different types of programs that have been provided, the countries in which they have been implemented, and the agents who have been targeted, as well as the recommendations given by various authors. It also identifies gaps in the research on suicide in education, such as the need: 1) for more qualitative or mixed studies that assess or identify aspects that are not easily explored with quantitative procedures; 2) to diversify the countries and cultural contexts in which educational initiatives on suicide are carried out; 3) to promote interventions and postventions in the aftermath of suicide acts; and, most importantly, 4) to reduce suicidal ideation and behavior by doing more than simply identifying participants' perception of changes in understanding of and attitudes toward suicide and suicide prevention. This information may be helpful in designing and developing appropriate new research projects and programs for reducing suicidal behaviors in educational settings.

Declarations

Competing interests: The authors report no potential conflict of interests.

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Data availability:

Acknowledgements:

Authors' contributions: The first author had the idea for the article, created the study design and performed the literature search. Authors one, two and three were in charge of data analysis. The first author drafted an initial version of the paper, which was critically revised and improved by the four authors. Author four made the linguistic format review.

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Tables

Table 1

Methodological Approaches of the 58 Studies Published Between 1990 and 2020 Reporting a Description or Assessment of Suicide Educational Interventions

Methodological approach	*N*	Studies
Pre-post study designs	11	(Flynn et al., 2016; Johnson & Parsons, 2012; Muehlenkamp et al., 2015; Testoni et al., 2018, 2020; Tompkins et al., 2010; Totura et al., 2019; Willson et al., 2020; Yousuf et al., 2013)
Cluster randomized controlled	10	(Ahern et al., 2018; Coleman et al., 2019; Gijzen et al., 2018; Han et al., 2018; Kahn et al., 2020; Mascayano et al., 2018; Pickering et al., 2018; Roberts et al., 2018; Robinson et al., 2014; Wasserman et al., 2015)
Pre-post study designs with follow up	9	(Breux & Boccio, 2019; Brown et al., 2018; Cha et al., 2018; Cimini et al., 2014; Hashimoto et al., 2016; Indelicato et al., 2011; Kinchin et al., 2020; Pullen et al., 2016; Schilling et al., 2014)
Post intervention study designs	6	(Brown & Grumet, 2009; Downs et al., 2014; Fendrich et al., 2000; Roberts et al., 2018; Ryerson, 1990; Thompson et al., 2010)
Quasi-experimental study	3	(Cramer et al., 2019; LaFromboise & Lewis, 2008; Shannonhouse et al., 2017)
Case study	3	(Callahan, 1996; Rivero et al., 2014; Schmidt et al., 2015)
Mixed methods design, drawing on complementary quantitative and qualitative data	2	(Chaniang et al., 2019; McCalman et al., 2016)
Not clearly described	2	(Mintz-Binder, 2007; Sattem, 1990)
Qualitative study using key informant interviews or discussion groups	3	(Chugani et al., 2020; Fernández Rodríguez & Huertas, 2013; Stein et al., 2010)
Solomon four-group design	1	(Kalafat & Elias, 1994)
Clinical trial	1	(Muriungi & Ndetei, 2013)
Intervention as baseline and follow up	1	(Stewart et al., 2020)
Inferential, retrospective, secondary regression analysis	1	(Biddle et al., 2014)
Longitudinal analysis	1	(Zenere & Lazarus, 2009)
In-depth qualitative case study discursively oriented	1	(White & Morris, 2010)
Qualitative descriptive exploratory research	1	(Fernandes et al., 2020)
First-person account	1	(Maples et al., 2005)
Delphi methodology	1	(Cox et al., 2016)

Table 2

Educational Programs Addressing Prevention, Intervention or Postvention Described or Assessed in Studies

Published Between 1990 and 2020

Program name	Brief description	Studies
	Prevention	
Puppet Prevention Program	A youth-system-based prevention and early identification process that uses puppets.	(Sattem, 1990)
Adolescent Suicide Awareness Program (ASAP)	A mental health education program for school communities designed to be implemented as a cooperative project between community mental health providers and local school systems.	(Ryerson, 1990)
Youth Suicide Prevention and Intervention Program	Universal suicide prevention strategies are implemented through the To Reach Ultimate Success Together curriculum in a series of skill development lessons.	(Zenere & Lazarus, 2009)
STOP Suicide Program (School-Based Teen Outreach Program for Suicide)	A program funded by the Substance Abuse and Mental Health Services Administration housed in the DC Department of Mental Health, USA.	(Brown & Grumet, 2009)
The Medicine Wheel Program	A culturally informed circle-of-care approach that builds upon mainstream suicide prevention strategies by incorporating traditional American Indian (AI) practices, knowledge, and outreach.	(Muehlenkamp et al., 2009)
Youth Suicide Prevention Program (YSPP)	The Los Angeles Unified School District (LAUSD)'s suicide prevention program.	(Stein et al., 2010)
Question, Persuade, Refer (QPR)	Gatekeepers training within the educational setting to identify and intervene when individuals are engaged in risky behaviors.	(Ahern et al., 2018; Fernández Rodríguez & Huertas, 2013; Indelicato et al., 2011; Johnson & Parsons, 2012; Muriungi & Ndetei, 2013; Pullen et al., 2016; Tompkins et al., 2010; Wasserman et al., 2015; Willson et al., 2020)
Signs of Suicide (SOS)	A 17-minute DVD that includes (1) three age-appropriate vignettes which are less intense than the high school version; (2) a group discussion by middle school students about depression, suicide, bullying, self-injury, and getting help; and (3) a student interview with a school-based counselor to model getting help.	(Schilling et al., 2014)
Yellow Ribbon Suicide Prevention Program (YRSPP)	The program integrates education on help-seeking behaviors and screening.	(Flynn et al., 2016; Schmidt et al., 2015)
Youth Aware of Mental Health program (YAM)	Promotes knowledge of mental health, healthy lifestyles, and behaviors.	(Ahern et al., 2018; Kahn et al., 2020; Wasserman et al., 2015)
Aussie Optimism Program (AOP)	A prevention educational program was implemented as a community-based project, with the collaboration of school nurses.	(Roberts et al., 2018)
Screening by	A two-stage screening tool to help health	(Ahern et al., 2018; Wasserman

Professionals (ProfScreen)	professionals to identify at-risk adolescents based on mental health responses in a self-report questionnaire.	et al., 2015)
Kognito At Risk (see www.kognito.com)	The trainee interacts with virtual peers and is given a menu of choices for interactions. They are led to identify peers who may be at risk.	(Coleman et al., 2019)
Healer Education Assessment and Referral (HEAR) program	This program uses secondary and tertiary prevention strategies to address depression and suicide.	(Downs et al., 2014)
Suicide Prevention Program (SPP)	The program involves a collaborative model that engages every sector of the university.	(Fernández Rodríguez & Huertas, 2013)
Multimodal stepped-prevention program	The program comprises screening with subsequent clinical evaluation and/or referral; gatekeeper training (QPR) for mentors; universal prevention focusing on stigma reduction; and identifying adolescents who have elevated signs of the most important risk factor for suicidal behaviors.	(Gijzen et al., 2018)
Sources of Strength	The program recruits and trains key opinion leaders (i.e., peer leaders) along with school staff members as advisors.	(Pickering et al., 2018)
Online psychoeducational program (ProHelp)	The program comprised two modules. Each module was designed to take approximately 5 min. The first module addressed suicide literacy, suicide and help-seeking stigma, and available help-seeking sources. The second module addressed self-reliance, social support, and myths about mental health professionals.	(Han et al., 2018)
Mental Health First Aid program	The program was a 2.5-h course, combining lectures, videos that demonstrated good and bad gatekeeper behavior, and small group role-plays along with the scenario of the videos.	(Hashimoto et al., 2016)
Comprehensive suicide response program	The curriculum provided detailed lesson plans for three 40 to 45-minute participatory classes.	(Kalafat & Elias, 1994)
Reframe-IT intervention	The intervention comprised 8 modules of Cognitive Behavioral Therapy delivered online across the 10-week intervention period.	(Robinson et al., 2014)
The Zuni Life Skills Development Program	Intervention strategies consistent with cultural and community life values and strengths.	(LaFromboise & Lewis, 2008)
Creating Suicide Safety in Schools (CSSS) workshop	A workshop was designed to encourage school personnel to evaluate their own schools' existing suicide prevention and intervention readiness and to plan ahead.	(Breux & Boccio, 2019)
Jason Foundation (JF) "A Promise for Tomorrow" program	The program promotes awareness of the problem of youth suicide, provides student trainees with the knowledge and resources to	(Totura et al., 2019)

	interact with at-risk youth, and encourages referral behaviors.	
Applied Suicide Intervention Skills Training (ASIST)	The program is a 14-hour, 2-day, suicide intervention training mode. SafeTALK is a condensed version of ASIST.	(Shannonhouse et al., 2017)
Thai Suicide Prevention Program for Secondary School Students (TSPPSSS)	The program comprised three modules addressed to adolescent peer leaders, parents and schoolteachers.	(Chaniang et al., 2019)
Beyond the Wall	Death education program aimed at helping young people to cope with being told of the suicide of students at their schools and to raise awareness of their negative emotions and their representations of death, to improve their ability to cope with negative thoughts.	(Testoni et al., 2020)
Safety Planning Intervention (SPI)	A structured personalized safety plan collaboratively completed by clinicians and clients to assist individuals in managing a suicidal crisis.	(Stewart et al., 2020)
Student Assistance Program (SAP)	Team members identify student psychosocial problems, determine if they are within school responsibility, and suggest interventions. When a problem is beyond the array of services provided at school, teams assist in accessing services within the community.	(Biddle et al., 2014)
	Intervention	
School crisis intervention program	A crisis protocol made up of different phases to address suicide crisis management.	(Cha et al., 2018)
Critical Incident Stress Management (CISM)	The program is a multicomponent seven-step process that is based on step-by-step interventions, timing, activation, goal, and format.	(Mintz-Binder, 2007)
Consultation and Resource Evaluation (CARE) program	Essential components of the program include assessment of student suicide risk, evaluation of student's willingness and ability to refrain from self-harm; consultation regarding needed psychiatric, psychological, and supportive educational services; parent information and supportive educational intervention.	(Rivero et al., 2014)
	Postvention	
Suicide Postvention Guidelines for schools	Designed to help secondary schools develop an Emergency Response Plan (ER Plan) and Emergency Response Team (ER Team) following a student suicide within the school.	(Cox et al., 2016)
Counselors, administrators, parents, and	The approach could be adapted to include the prevention and intervention phases of dealing with teen suicides.	(Maples et al., 2005)

teachers (CAPT) Team Approach

Table 3

Educational Setting of the Studies

	Educational Setting						
Phase addressed	**Primary school**		**Secondary and high school**		**College**		
	N (%)	Studies	*N* (%)	Studies	*N* (%)	Studies	**Total *N* (%)**
Intervention	2 (3.44%)	(Roberts et al., 2018; Sattem, 1990)	32 (55.17%)	(Ahern et al., 2018; Breux & Boccio, 2019; Brown et al., 2018; Brown & Grumet, 2009; Chaniang et al., 2019; Conforti et al., 2020; Fendrich et al., 2000; Flynn et al., 2016; Gijzen et al., 2018; Johnson & Parsons, 2012; Kahn et al., 2020; Kalafat & Elias, 1994; Kinchin et al., 2020; LaFromboise & Lewis, 2008; Mascayano et al., 2018; McCalman et al., 2016; Pickering et al., 2018; Roberts et al., 2018; Robinson et al., 2014, 2015; Ryerson, 1990; Schilling et al., 2014; Schmidt et al., 2015; Shannonhouse et al., 2017; Stein et al., 2010; Testoni et al., 2018; Tompkins et al., 2010; Totura et al., 2019; Wasserman et al., 2015; White & Morris, 2010; Zenere & Lazarus, 2009)	16 (27.58%)	(Chugani et al., 2020; Cimini et al., 2014; Coleman et al., 2019; Cramer et al., 2019; Downs et al., 2014; Fernandes et al., 2020; Fernández Rodríguez & Huertas, 2013; Han et al., 2018; Hashimoto et al., 2016; Indelicato et al., 2011; Muehlenkamp et al., 2009; Muriungi & Ndetei, 2013; Pullen et al., 2016; Stewart et al., 2020; Thompson et al., 2010; Willson et al., 2020; Yousuf et al., 2013)	50 (86.20%)
Postvention	-	-	1 (1.72%)	(Biddle et al., 2014)	2 (3.44%)	(Mintz-Binder, 2007; Rivero et al., 2014)	3 (5.17%)

N (%)	-	-	5 (8.62%)	(Callahan, 1996; Cha et al., 2018; Cox et al., 2016; Maples et al., 2005; Testoni et al., 2018)	-	-	5 (8.62%)
	2 (3.44%)		38 (65.51%)		18 (31.02%)		58 (100%)

Figures

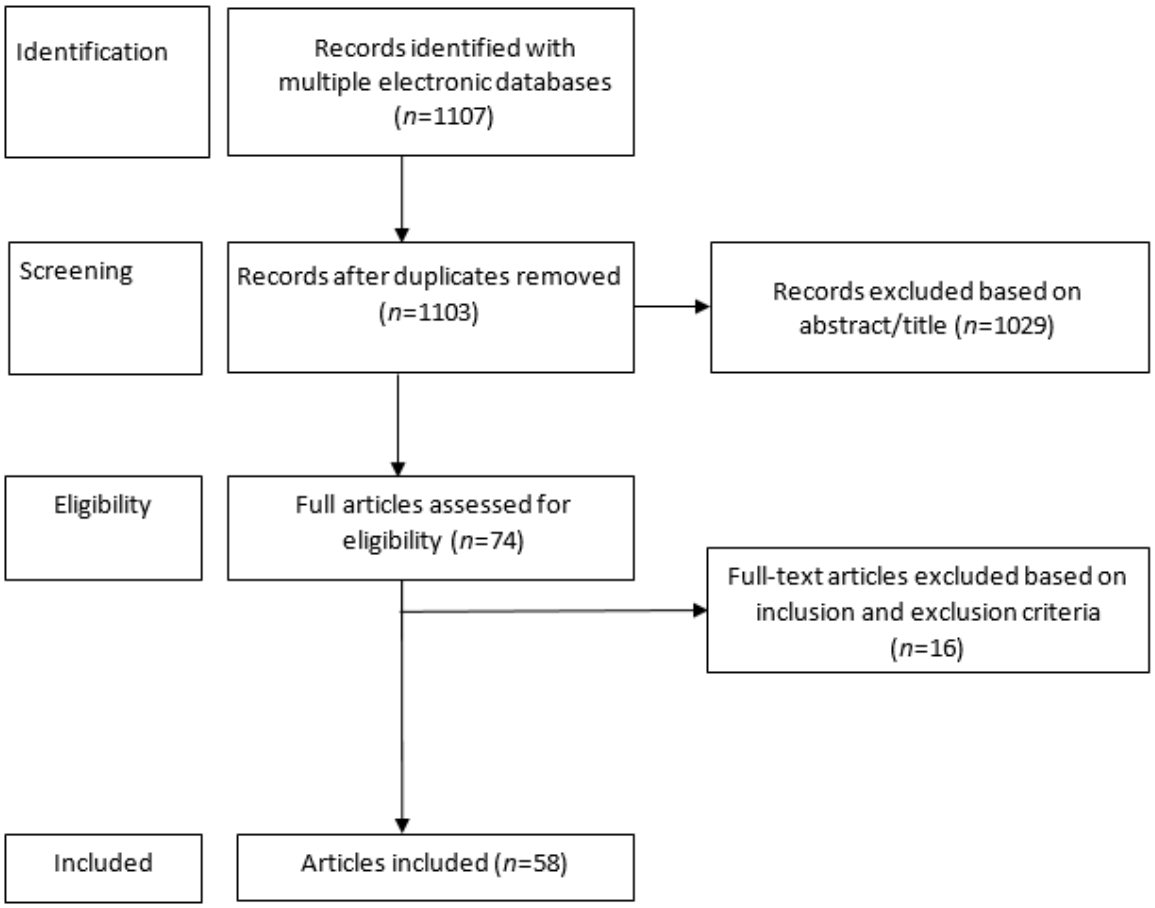

Figure 1

PRISMA flow chart of the selection procedure

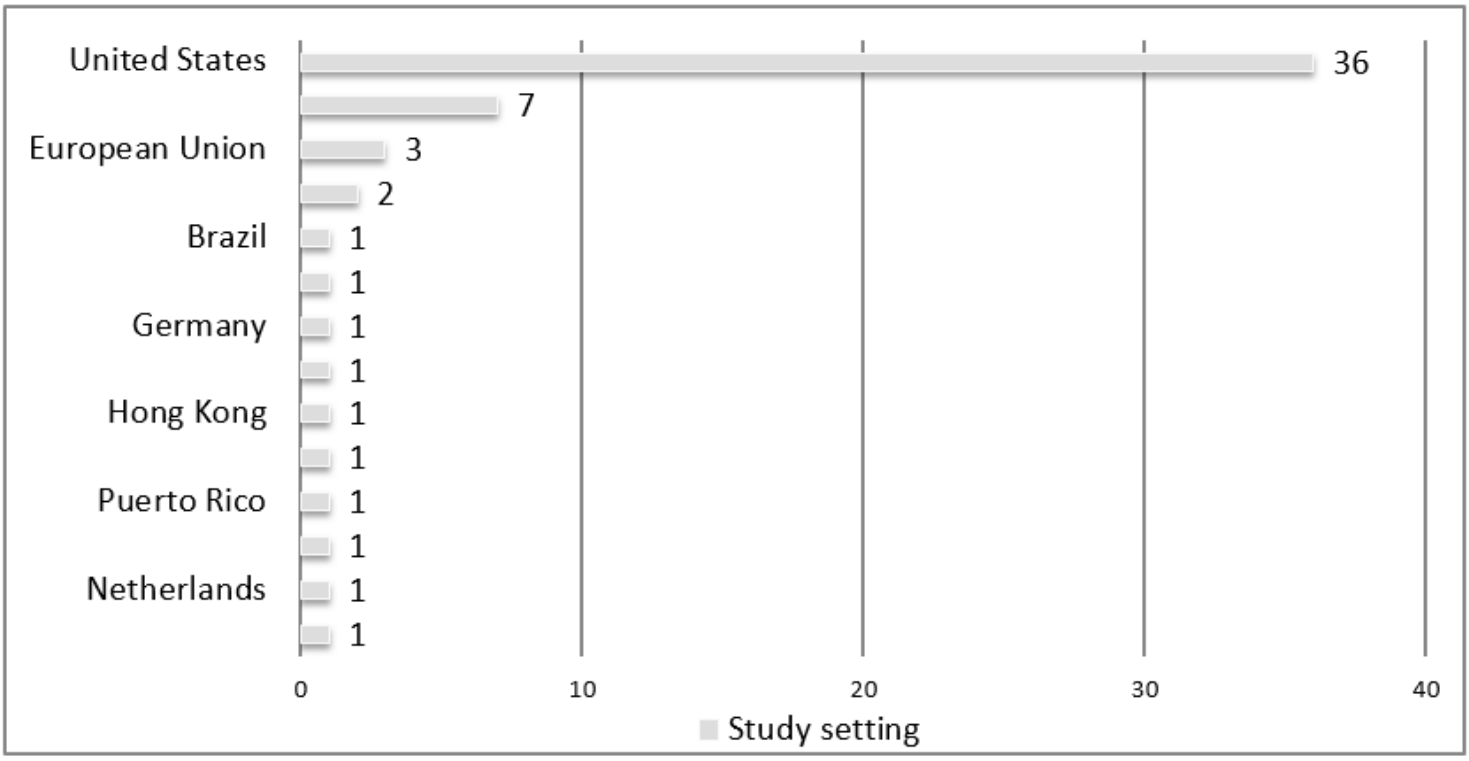

Figure 2

Geographical Distribution of Suicide Educational Programs Addressing Prevention, Intervention, or Postvention Described or Assessed in Studies Published Between 1990 and 2020