

Review: Interventions to prevent or manage self-harm among students in educational settings – a systematic review

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Background: At least half of all young people who die by suicide have previously self-harmed and most of those who self-harm will not seek help from health services for self-harming behaviours. By default, schools, colleges and universities necessarily play a key role in identifying those who self-harm and supporting them to access help. **Methods:** We conducted a systematic review (PROSPERO ID: CRD42021243692) of five databases (Medline, PsycINFO, ASSIA, ERIC and BEI) for quantitative studies evaluating interventions to reduce self-harm among students in schools, colleges and universities. **Results:** We identified six eligible studies that reported interventions. Two interventions used mindfulness-based approaches and the remaining four interventions focused on in-classroom education. Three interventions reported a significant reduction in self-harm, all three used in-classroom education. Of the six studies, one study was rated methodologically moderate, while the remaining five were weak. **Conclusion:** In summary, the evidence base is limited in size and quality. Most current interventions to address self-harm in schools focus on training staff in awareness, with a significant gap in direct support for students.

Key Practitioner Message

- At least half of all young people who die by suicide have previously self-harmed and most of those who self-harm will not seek help from health services for self-harming behaviours.
- By default, schools, colleges and universities necessarily play a key role in identifying those who self-harm and supporting them to access help.
- The evidence base is limited in size and quality. Most current interventions to address self-harm in schools focus on training staff in awareness, with a significant gap in direct support for students.
- Future research needs a much improved theoretical and empirical basis to develop, evaluate and implement direct interventions with young people who self-harm.

Keywords: Self-harm; school; intervention; mental health; adolescence

Introduction

Self-harm, or intentional injury of one's body with or without conscious suicidal intent (Nock, 2008), is increasingly prevalent among young people, particularly young women in their late teens and early twenties. (Ford, 2020; McManus et al., 2019). In the UK, girls presenting to clinical services following self-harm increased by 68% among 13–16-year-old girls between 2011 and 2014 (Hawton, Bale, et al., 2020). The Multicentre Study of Self-harm in England (2000–07) reported an annual incidence of self-harm among those who present to hospitals of 67 per 100,000 in boys and 466 per 100,000 in girls aged 10–14 years old (Geulayov et al., 2018). People who have self-harmed are at much greater risk of future episodes of self-harm and suicide than the general population (Chan et al., 2016). The absolute risk of suicide in adolescents remains low, at 5.4 per 100,000 in 2015 in the UK (Morgan et al., 2017), but suicide is the second most common cause of death in 15–24 year olds

worldwide, and the leading cause of death in young people in the UK (Mokdad et al., 2016). At least half of all young people who die by suicide have previously self-harmed (Hawton, Bale, et al., 2020). Effective support for young people who self-harm is therefore essential.

Data for self-harm prevalence in the community are scarce; but two school-based surveys and a birth cohort suggest 7%–11% of young people reported an act of self-harm in the previous year, which implies only a small proportion of those who self-harm access health services (Hawton, Haw, Houston, & Townsend, 2002; Kidger, Heron, Lewis, Evans, & Gunnell, 2012; Morey, Mellon, Dailami, Verne, & Tapp, 2017). For example, 60% of individuals who reported self-harm in the Adult Psychiatry Morbidity Survey in England 2014, were not in contact with either psychological or medical services (McManus et al., 2019). Schools, colleges and universities are by default front-line mental health services because of their longer-term relationship with young people, combined with regular contact. (Ford, Hamilton,

Meltzer, & Goodman, 2007; Newlove-Delgado, Moore, Ukoumunne, Stein, & Ford, 2015) and therefore play a key role in identifying and potentially supporting those who self-harm to access help if needed and wanted. Arguably, these institutions have a role in identification and support as well as providing an ideal setting for prevention. However, school staff are not mental health specialists. As young people may also be inclined to self-harm by mimicking others (Hawton, Saunders, & O'Connor, 2012), existing school structures may provide levers to prevent or reduce self-harm (Evans & Hurrell, 2016).

Although school staff are often very concerned about self-harm and keen to support early identification and timely support for those at risk of self-harm, they are reticent to explicitly discuss self-harm with the student population due to fears of contagion and concerns about maintaining the balance between raising awareness and promoting self-harm (Duncan et al., 2019; Evans et al., 2019). Contagion, also known as social transmission, occurs when exposure to suicide or self-harm facilitates suicidal behaviour in another individual or group (Hawton, Hill, et al., 2020). Exposure can be indirect and direct. The former occurs through certain types of media reports or fictional portrayals of suicide, whereas direct exposure involves self-harm or suicide occurring within the individual's social network school staff often cited 'fear of contagion' as a major barrier to talking about self-harm with students (Evans, Russell, & Mathews, 2016). Students with recent negative life events who attended schools where a fellow student had recently died by suicide had significantly greater odds of serious suicidal ideation or behaviour than students with recent negative life events in non-exposed schools. However, studies in this area have shown that asking adolescents about suicidal ideas does not increase risk of suicidality developing, rather the findings suggested that asking about suicidal ideation or behaviour may have been beneficial for students with depression symptoms or previous suicide attempts (Gould et al., 2005). These same concerns hamper the study of self-harm in both young people and adults.

Another major concern of teachers is how they should handle a disclosure of self-harm and what they can and should do to support their pupils, given that they are not, and should not try to be, mental health therapists.

Studies of interventions in schools that aim to reduce self-harm are mostly aimed at teaching staff in secondary (high) schools (Pierret, Anderson, Ford, & Burn, 2020). Interventions include setting up in-person and online workshops to increase teachers understanding of how to recognise and respond to self-harm, with mixed effectiveness (Glennon, Viola, & Blakely, 2020; Groschwitz, Munz, Straub, Bohnacker, & Plener, 2017; Townsend, Gray, Lancaster, & Grenyer, 2018). Interventions directed at self-harm seem scarce, and our initial scoping searches suggested that school-based interventions mainly focus on suicide prevention, for example Saving and Empowering Young Lives in Europe (SEYLE; Wasserman et al., 2010) and Signs of Suicide (SOS) (Aseltine & DeMartino, 2004; Schilling, Lawless, Buchanan, & Aseltine, 2014).

The SEYLE study was a multicentre, cluster-randomised controlled trial (Wasserman et al., 2010). In the SEYLE study, 11,110 adolescents (mean age 15 years) were randomly allocated to one of three

prevention programmes: gatekeeper training for school staff, mental health screening and Youth Aware of Mental Health programme (YAM; five sessions of student role play, focusing on mental health). Results showed a significant reduction in suicidal ideation and attempts for the YAM programme but not for the gatekeeper training nor the screening programme. Direct effects on self-harm were not considered in this study.

The Signs of Suicide programme (SOS) is a school-based suicide prevention programme that serves secondary school students ages 13–18 years old (Aseltine & DeMartino, 2004; Schilling et al., 2014). SOS promotes the concept that suicide is directly related to mental illness, typically depression, and that suicide is not a normal reaction to stress or emotional upset. The programme consists of a video and a discussion guide. Students also complete and score the Columbia Depression Scale. Evaluation of this programme showed short-term impact on the attitudes and behaviours of students by significantly reducing rates of self-reported suicide attempts in the 3 months following exposure to the programme. However, the SOS programme had no significant effects on suicidal ideation and help-seeking behaviours and there was no consideration of self-harm.

Given self-harm is much more common and not necessarily related to the suicidal ideation, it seems unclear how self-harm is being addressed and managed in schools, despite common presentations to teachers. We therefore aimed to identify whether any evidence-based interventions exist for use in schools, colleges and universities to manage self-harm in young people who have not accessed healthcare services; to assess the quality of the evidence and identify gaps for future research. This review encompasses two specific research questions:

What evidence exists for direct interventions with students to reduce or prevent self-harm or improve other student outcomes, including reduction in psychological distress, improved mental health, improved emotional regulation, problem solving and coping skills among students?

What is the feasibility, effectiveness and cost-effectiveness of interventions addressing self-harm with students in educational settings?

Methods

The systematic review was prospectively registered with PROSPERO (CRD42021243692) on 26th March 2021.

Search strategy and selection criteria

Studies included in this review were identified through systematic searches of Medline, PsycINFO, Education Research Information Centre (ERIC), Child Development & Adolescent Studies, Applied Social Science Index and Abstracts (ASSIA) and British Education Index on 01/04/2021, an updated search was conducted on 27/04/2022. No time period for publication date was specified. Supplementary search methods included forward and backward citation searching of included studies.

The search terms were a combination of words and phrases related to self-harm, suicide, students, schools, colleges, universities (henceforth referred to as educational settings or schools) and intervention/programme. The complete search strategy for each database is available in the supplementary files (see Table S1).

Eligibility criteria

Table 1 specifies the inclusion criteria. The *population* was children and young people aged 4–25 years old in education. The *intervention* was training or programmes delivered directly to young people and focused on the reduction in self-harm with or without a focus on suicide among young people. Any *comparator* was included where present, single-arm non-controlled studies were eligible. Primary *outcomes* were levels of self-harm behaviour among young people. Secondary outcomes were a reduction in psychological distress, improved mental health, improved emotional regulation, problem solving and coping skills among students. All included studies had to be set in a school, college or university.

We excluded studies from universities and colleges that ONLY included postgraduates, to keep a focus on adolescents and emerging adults, although we did not restrict studies of further education to undergraduates. Thus some would include mature students or postgraduates over the age of 25. Given peak incidence of self-harm occurs in the late teenage years and early 20s then universities and colleges may well have developed interventions that could be adapted down the age span to schools. Studies of postgraduate students were excluded to keep a focus on children, adolescents and emerging adults. Further exclusion includes studies that did not take place in educational settings, did not include outcomes of interest, qualitative, not peer-reviewed studies, commentaries, reviews, editorials, case studies and opinion pieces.

Study selection

Search results were managed using CADIMA (<https://www.cadima.info/index.php>); Figure 1 describes the selection of papers. In the first instance, RFN, JKA and LC screened titles and abstracts, and 10% of the title and abstracts were double-screened. All disagreements were resolved through discussion.

Table 1. Inclusion criteria for title and abstract screening and full-text screening

Criteria	Specification
Population	Young people in education (aged 4–25 years)
Intervention/ Exposure	Training, learning or development session, material or programme focused on the reduction in self-harm or self-harm and suicide among young people, delivered to young people.
Comparator	Different intervention or no intervention at all
Outcome	Primary outcomes: A reduction in self-harm behaviour among young people. Secondary outcomes: outcomes include reduction in psychological distress, improved mental health, improved emotional regulation, problem solving and coping skills among pupils.
Country/Language Setting	Any country but paper written in English Any educational setting such as schools, further education colleges and universities, including alternative provision, special schools, faith schools, grammar, secondary, high school and independently funded/private.
Study design	Primary research and quantitative studies including randomised controlled trial, quasi-randomised controlled trial, single-arm controlled and non-controlled, controlled and non-controlled before-and-after study, prospective cohort study.

Subsequently all full texts of previously included studies were double-screened by RFN and LC. Disagreements were resolved through discussion with JKA.

Data extraction

Data from included studies were extracted into a pro forma developed for this review (see Table 2). The extraction method was pilot tested by RFN and checked by JKA. The following information was extracted: author/year/country of publication; study design; study aims; sample sizes and participants' characteristics; data collection methods; findings for each research question. The Template for Intervention Description and Replication (TIDieR) reporting checklist (Hoffmann et al., 2014) was used to extract intervention data including the contents of the intervention; where, when and by whom it was provided (see Table 2). Extraction tables were independently checked by a senior systematic reviewer (JKA) for all included papers.

Quality appraisal

Included studies were appraised using the Effective Public Health Project Practice (EPHPP) Quality Assessment Tool for Quantitative Studies (Armijo-Olivo, Stiles, Hagen, Biondo, & Cummings, 2010). The EPHPP tool has fair inter-rater agreement and evaluates risk of bias (Armijo-Olivo, Stiles, Hagen, Biondo, & Cummings, 2010). The EPHPP tool assesses six domains: (1) selection bias; (2) study design; (3) confounders; (4) blinding; (5) data collection method; and (6) withdrawals/dropouts. Each of the six domains is rated as weak, moderate, or strong. The final quality ratings for each paper were recorded after averaging the individual scores and the final rating was either weak, moderate or strong. Quality appraisals were independently carried out for all included studies by two reviewers (RFN and LC), while disagreements were resolved by discussion with JKA.

Synthesis

We provided a numerical description of included studies. Due to the high heterogeneity of study designs, interventions and outcome measures, conducting a meta-analysis was not appropriate. To summarise available evidence, draw conclusions and make recommendations we carried out a narrative synthesis of evidence using an existing framework (Popay et al., 2006) recommended for use in systematic reviews focusing on a wide range of questions, rather than only on the effectiveness of a particular intervention. This framework comprises four main stages that are iterative rather than linear: (1) developing a theory of how the intervention works, why and for whom, (2) developing a preliminary synthesis of findings in included studies, (3) exploring relationships in the data and (4) assessing the robustness of the syntheses.

Results

The initial search generated 4254 publications, leaving 3167 after duplicates were removed (Figure 1) for article title and abstract screening. A total of 42 papers were eligible for full-text review, at which point a further 36 were excluded. Reasons for exclusion included the lack of a self-harm outcome measure, peer-review or an intervention, or the study was not based in an educational setting. A total of six full-text papers were identified and included in the final review.

Study characteristics

Two studies used a single-arm non-controlled non-randomised study design (Muehlenkamp, Walsh, & McDade, 2010; Roberts et al., 2019). Two studies used a single-arm controlled non-randomised study design (Argento, Simundic, Mettler, Mills, & Heath, 2020; Fukumori, Kuroda, Ito, & Kashimura, 2017). One study

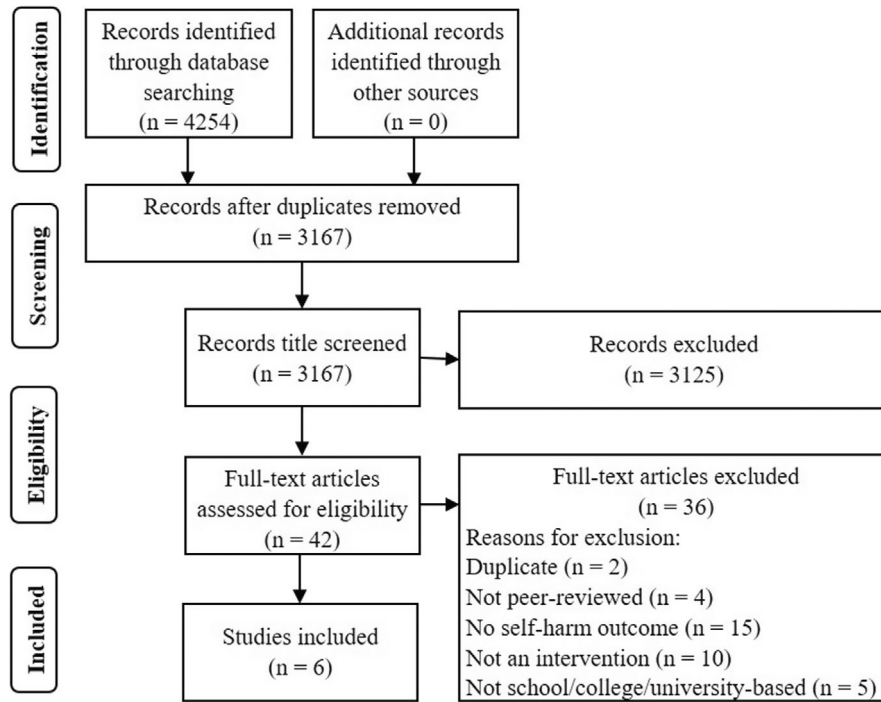


Figure 1. PRISMA flow chart for selection process of studies in systematic review

used a two-arm controlled randomised study design (Baetens, Decruy, Vatandoost, Vanderhaegen, & Kiekens, 2020). The remaining study was a cluster randomised control trial (Stallard et al., 2013). For a full breakdown of study characteristics, see Table 2.

The number of participants across the studies ranged from 22 to 5030, with 6743 in total. Where reported, mean participant age ranged from 12 to 22 years. Four studies took place in secondary schools or high-schools (Baetens et al., 2020; Muehlenkamp et al., 2010; Roberts et al., 2019; Stallard et al., 2013), while two studies took place in universities (Argento et al., 2020; Fukumori et al., 2017).

All studies were conducted in the last decade, and were carried out in higher income countries, namely the UK (Roberts et al., 2019; Stallard et al., 2013), Canada (Argento et al., 2020), Belgium (Baetens et al., 2020), Japan (Fukumori et al., 2017) and the USA (Muehlenkamp et al., 2010).

All six studies used different tools to measure self-harm, which included the Inventory of Statements about Self-Injury (ISAS) (Argento et al., 2020), Brief Non-Suicidal Self-Injury Assessment Test (BNSSI-AT) (Baetens et al., 2020), The Self-Harm Ideation Scale (Fukumori et al., 2017) and the Self-Injurious Thoughts and Behaviours Inventory (SITBI) (Muehlenkamp et al., 2010). Two studies mentioned a self-harm risk assessment but did not state the specific measure used (Roberts et al., 2019; Stallard et al., 2013).

Interventions

For a description of each intervention, see Table 3. The two studies taking place in a university setting used a mindfulness-based intervention (Argento et al., 2020) and a structured writing programme, respectively (Fukumori et al., 2017). The four interventions taking place in schools focused on in-classroom education about self-

harm (Baetens et al., 2020; Muehlenkamp et al., 2010), targeted group sessions (Roberts et al., 2019) and classroom-adapted CBT (Stallard et al., 2013).

Argento et al. (2020) used a targeted intervention delivered by researchers to examine the impact of a brief mindfulness activity compared to a control task on state mindfulness and perceived stress. Using random assignment and a single-blind method, roughly half of those with history of self-harm and those without were placed into the mindfulness activity condition (MIND) or the control condition (LETTER). In the MIND group, participants completed a 10 min-guided body scan to induce a state of mindfulness. The LETTER group was an active control in which were given 10 min to complete a letter and number matrix.

The second university-based study (Fukumori et al., 2017) used a targeted intervention delivered by researchers to investigate the efficacy of structured writing on reducing self-harm ideations and enhancing emotion regulation. For three consecutive days, participants in the intervention group performed structured writing that included psychoeducation and self-reflection about emotions.

Three of the four studies in the school setting (Baetens et al., 2020; Muehlenkamp et al., 2010; Stallard et al., 2013) modified existing interventions so they would address self-harm in the classroom and one study created a new programme (Roberts et al., 2019).

Baetens et al. (2020) used a universal intervention to examine the differences between a general in-classroom prevention programme (Happyles) and the same programme combined with a module on non-suicidal self-injury (HappylesPLUS). The Happyles groups received two 50-min in-classroom prevention lessons with classroom discussions, assignments and two guided e-health lessons. The HappylesPLUS group received the same classes as the Happyles group with the addition of a 60-

Table 2. Description of the included studies

1st Author, year and country	Study design	Aim of study	Sample size and description	Educational setting and delivery	Self-harm outcome measures	Results – self-harm outcomes measures
Argento 2020, Canada	Single-arm controlled non-randomised	Examine the impact of a brief mindfulness activity to a control task on state mindfulness (Objective 1) and perceived stress (Objective 2) following a stress induction task with university students with a history of self-harm engaged harm compared to those without.	All women N = 68 Control N = 76 M age = 20.17 years	Undergraduates at one university Targeted and delivered by researchers	Inventory of Statements about Self-injury (ISAS). No follow-up data.	Objective 1: There was no statistically significant three-way interaction between group, condition and time ($p = .81$, $\eta^2 = .000$). Objective 2: There was no statistically significant 3-way interaction between group, condition and time ($p = .58$, $\eta^2 = .002$).
Baetens 2020, Belgium	Two-arm controlled randomised	Examine the differences between a general in-classroom prevention programme (Happyles) and programme combined with a 1 hr in-classroom psychoeducation module on self-harm (HappylesPLUS).	N = 311 Control N = 340 Girls = 326 Boys = 323 Not stated = 2 M age = 12.85 years	Six secondary schools Universal delivery	Brief Non-Suicidal Self-Injury Assessment Test (BNSSI-AT). No long-term follow-up data.	Reduced likelihood of future self-harm engagement ($p < .001$). No significant effect when asked about the urge to self-harm over the past month ($p = .317$).
Fukumori 2017, Japan	Single-arm controlled non-randomised	The study investigated the efficacy of structured writing on reducing self-harm ideations and enhancing emotion regulation.	N = 10 Control N = 12 Women = 15 Men = 9 M Age = 19.40 years	One University Targeted and delivered by researchers	The Self-Harm Ideation Scale 2-week follow-up 1-month follow-up	Significant short-term effect on self-regulation of negative moods ($p = .042$) but the effect of structured writing on self-harm ideation was not significant ($p = .18$). The effect sizes between baseline and 1-month follow-up indicated that Cohen's $d = .45$ in the intervention group and Cohen's $d = -.20$ in the control group.

(continued)

Table 2. (continued)

1st Author, year and country	Study design	Aim of study	Sample size and description	Educational setting and delivery	Self-harm outcome measures	Results – self-harm outcomes measures
Muehlenkamp 2010, USA	Single-arm non-controlled non-randomised	To conduct an initial evaluation of the effectiveness and feasibility of the Signs of Self-Injury (SOSI) programme in achieving the goals of increasing self-harm knowledge, improving attitudes and comfort towards help-seeking for NSSI, increasing help-seeking behaviours for peers or self, and decreasing acts of self-harm.	N = 274 Girls: 141 Boys: 133 M age = 16.07 years No control group	Five high schools Universal delivery by school counsellor	Self-Injurious Thoughts and Behaviours Inventory (SITBI). Attitudes to Self-Injury. 5 weeks follow-up	Significant improvements in accurate knowledge about self-harm ($p < .01$, $\eta^2 = .064$), as well as significant changes in approach/helping desire attitudes towards self-harm ($p < .01$, $\eta^2 = .047$)
Roberts 2019, UK	Single-arm non-controlled non-randomised	To evaluate Mind and Body (MAB), an early intervention group programme for adolescents at risk of, or engaging in, self-harm behaviours.	N = 622 No age reported No control group	Secondary schools in Cornwall, Kent and Lancashire Targeted/indicated and delivered by external experts	Self-harm risk assessment (no further information given). No follow-up data	Reported a 67% reduction in self-harm thoughts after the programme ($p < .05$). Effect sizes not mentioned.
Stallard 2013, UK	Cluster RCT	To investigate the clinical effectiveness and cost-effectiveness of classroom-based cognitive-behavioural therapy (CBT) in reducing symptoms of depression in high-risk adolescents. Effects on self-harm was a secondary outcome.	N = 392 Girls: 2467 Boys = 2563 M age = 14.1 years	Mixed-sex secondary schools Universal delivery by teachers or researchers	Self-harm among those at risk of depression according to the Moods and Feelings Questionnaire (no further information given). 6-month and 12-month follow-up.	Non-significant reduction in self-harm thoughts ($p = .607$) and self-harm behaviours ($p = .644$) at 12 months for classroom-based CBT vs usual PSHE control. Non-significant reduction in self-harm thoughts ($p = .880$) and self-harm behaviours ($p = .192$) at 12 months for classroom-based CBT vs attention control PSHE.

Table 3. Description of interventions using TIDieR

1st Author and year	What	Rationale and/or theory	Delivery	How	Where	When and how much	Tailoring and modifications
Argento 2020	Examines the impact of a brief mindfulness activity to a control task on state mindfulness (objective 1) and perceived stress (objective 2) following a stress induction task with university students with a history of NSSI engagement compared to those without. It	Theoretical frameworks posit that engagement in non-suicidal self-injury (NSSI) is due to an inability to regulate one's emotions. In turn, mindfulness-based interventions have been shown to enhance emotion regulatory processes in those who engage in NSSI.	Delivered by researchers in the team	Participants were recruited from a database of undergraduate university students who participated in a previous non-experimental study on stress and coping with additional participants recruited using advertisements on campus and student social media pages.	University laboratory	All participants were asked to complete pre-intervention measures of state mindfulness and stress and were randomly assigned to either a mindfulness activity (body scan – 10 min) or control task condition (10 min). Following the completion of their respective activities, a Stroop stress induction task was conducted, and participants completed post-intervention measures of state mindfulness and stress.	N/A
Baetens 2020	Differences are examined between a general in-classroom prevention programme (Happyles) and this programme combined with a 1-hr in-classroom psychoeducation module on NSSI (HappylesPLUS) in terms of primary (e.g. delay in NSSI onset and decrease in NSSI frequency, urges, probability of future engagement) and secondary outcomes (e.g. psychological distress, emotion regulation, help-seeking and stigma) using a mixed-method design.	Based on the stepped-care prevention programme Happyles. Happyles has been shown to reduce internalising symptoms, especially in high-risk groups. However, the effectivity regarding the prevention of NSSI has not been examined thus far.	Administrative personnel of the schools	The researchers contacted the principals of some of the schools based on regional proximity, while other schools were known to the research unit because of previously reported NSSI incidents in these schools.	Secondary schools	In one group each class received two in-classroom prevention lessons with classroom discussions and interactive assignments and two guided e-health lessons, all of which lasted about 50 min. The second group received the class room prevention programme above combined with the psychoeducation module on NSSI. This 50-min in-classroom module covered relevant topics in the prevention of NSSI: basic NSSI knowledge (prevalence, functions and risk factors), the role of	Added a psychoeducation component targeting NSSI.

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Table 3. (continued)

1st Author and year	What	Rationale and/or theory	Delivery	How	Where	When and how much	Tailoring and modifications
Fukumori 2017	The study investigated the efficacy of structured writing on reducing self-harm ideations and enhancing emotion regulation.	Studies have suggested that writing plays a significant role in processing a person's emotions and in reducing chronic avoidance patterns.	Researchers delivered the writing course.	The Self-Harm Ideation Scale was administered to students in a national university in western Japan to screen and recruit participants.	University	social media, (de-)stigmatisation of NSSI and help-seeking for NSSI. 6 weeks after receiving the classes, all participants took part in a 15 min personal feedback session. A three-day individual intervention programme of structured writing. The writing task was conducted for approximately 25 min a day in a soundproof chamber, by using a workbook.	This intervention incorporated the Emotion Regulation Group programme and the DBT workbook
Muehlenkamp 2010	The signs of self-injury programme are a school-based prevention programme for adolescents that attempts to increase knowledge, improve help-seeking attitudes and behaviours, and decrease acts of non-suicidal self-injury.	Students reporting deliberate self-harm suggest that adolescents who do not formally seek help have similar levels of psychopathology than those who do present for formal treatment. Thus, high school students who are engaging in NSSI are likely to benefit from some type of intervention and increased access to formal help.	All programme sessions were implemented by the school counsellor or psychologist who was also the study contact person. The same research assistants returned to the classrooms to administer the 5-week follow-up survey.	Potential participating high schools were contacted by a researcher and a total of 21 school counsellors or psychologists expressed interest.	High school classroom	One 50-min class period. A student module implemented in one class period using a multimedia DVD. Students presented with information about NSSI, signs and symptoms. Students then watch a series of video vignettes and respond to peer NSSI by using the ACT model; acknowledging the signs, demonstrating care for the person and a desire to offer help and to tell a trusted adult. Then a moderated class discussion is held to answer questions, provide information, and describe school and local resources available to students.	Schools implemented the existing signs of self-injury (SOSI) programme.

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Table 3. (continued)

1st Author and year	What	Rationale and/or theory	Delivery	How	Where	When and how much	Tailoring and modifications
Roberts 2019	Study evaluated mind and body (MAB), an early intervention group programme for adolescents at risk of, or engaging in, self-harm behaviours.	Research into community-based support for self-harm is limited but studies suggest programmes based within schools and/or that involve peers and non-familial supportive adults such as teachers, could be beneficial. Making further research into community-based early intervention group programmes essential.	Delivered by the charity Addaction	Implemented in schools with existing partnerships with the charity.	Secondary schools and community-based clinics.	8 weekly group sessions and 3 one-to-one sessions. Group sizes were between 6–8 students.	No data reported
Stallard 2013	Investigated the clinical effectiveness and cost-effectiveness of classroom-based CBT in reducing symptoms of depression in high-risk adolescents compared with a school's usual Personal, Social and Health Education (PSHE) curriculum and an attention control PSHE group.	Depression is a major problem in adolescents, and few young people are referred for treatment. This study investigates alternative approaches for interventions available in schools.	Delivered by researchers in the team. Manual states CBT must be provided by trainers external to the school.	Information sent to schools and schools had a face-to-face meeting with researchers to discuss the project.	Mixed-sex secondary schools in the UK	Intervention provided during school day as part of the PSHE curriculum. Students have a workbook covering 11 sessions. Sessions are held within the PSHE lessons or sessions can be combined and delivered over six, 75–90-min periods when double periods of PSHE are present.	Used the Australian-developed Resourceful Adolescent Programme (RAP) CBT programme in a UK context, the structure and method of delivery have been revised to fit in with the UK state secondary education system.

min in-classroom psychoeducation module on non-suicidal self-injury (NSSI). This session consisted of basic NSSI knowledge (prevalence, functions, risk factors), the role of social media, de-stigmatisation of NSSI and help-seeking for NSSI.

Muehlenkamp et al. (2010) used a universal intervention delivered by the school counsellor to implement the Signs of Self-Injury (SOSI) programme, which is based on the Signs of Suicide (SOS) programme (Aseltine & DeMartino, 2004; Schilling et al., 2014). SOSI involves psychoeducation for school staff and students using resources developed by the research team. School staff learn the warning signs of self-harm and how to respond to self-harm disclosure. Students received a 50-min in-classroom component that focuses on the ACT model (acknowledge the signs, care for the person by showing desire to help and tell trusted adults) for supporting peers who self-injure.

Stallard et al. (2013) used a universal intervention delivered by researchers and teachers to examine the Resourceful Adolescent Programme (RAP – UK) which is a CBT-based intervention delivered by external facilitators, aiming to primarily reduce symptoms of depression in young people aged 12–15 years. The study had three groups; the control group received the usual Personal, Social and Health Education (PSHE) curriculum delivered by one teacher. The attention control group received usual school PSHE delivered by one teacher and additional support from two facilitators. In the final group, two facilitators delivered the classroom-based RAP – UK CBT sessions. The CBT sessions consisted of 50–60-min sessions taking place over 9 weeks covering the following topics: personal strengths, helpful thinking, keeping calm, problem solving, support networks and keeping the peace.

The final school-based study (Roberts et al., 2019) used a targeted intervention delivered by external experts to evaluate Mind and Body (MAB), an early intervention group programme for adolescents at risk of or engaging in, self-harm behaviours. The intervention comprises of completion of a screening tool, eight group sessions and three one-to-one sessions for needs-based support. The screening tool is completed by students to monitor thoughts and actions about self-harm and identify young people not previously known to school staff for being at risk of self-harm. Trained practitioners delivered the sessions in schools.

Reduction in self-harm and other outcomes

The effectiveness of interventions on reduction in self-harm behaviour and suicide and self-harm ideation varied between studies for both primary and secondary outcomes. For example, the brief mindfulness activity in university students with history of self-harm significantly reduced stress levels ($p = .001$), while the effect of the intervention on self-harm ideation was unclear (Argento et al., 2020). The adapted classroom-based programme for students with a history of self-harm found a reduced likelihood of future self-harm engagement ($p < .001$) (Baetens et al., 2020), which is interesting given there were no significant differences when asked about the urge to self-harm over the past month ($p = .317$). This suggests an effective coping mechanism given that students still reported the urge to self-harm but also a reduction in self-harm behaviour. The structured writing

programme for university students did not have a significant effect on self-harm ideation ($p = .018$) although there was a short-term effect on self-regulation of negative moods ($p = .042$) (Fukumori et al., 2017). The Signs of Self-Injury programme (SOSI) showed significant improvements in accurate knowledge about self-harm ($p < .01$), as well as significant changes in attitudes towards self-harm ($p < .01$), but no significant increases in self-reported formal help-seeking behaviours for self or friends. Self-harm acts in the month before and after implementation of the SOSI programme did not significantly increase, with a trend that tentatively suggested a potential decrease in self-harm engagement ($p = .07$) (Muehlenkamp et al., 2010). The Mind and Body programme (Roberts et al., 2019) found students who disclosed self-harm thoughts before the programme reported a 67% reduction in self-harm thoughts after the programme ($p < .05$). Finally, classroom-based CBT (Stallard et al., 2013) showed no evidence of reduction in self-harm thoughts ($p = .607$) and self-harm behaviours ($p = .644$) at 6 months compared with self-harm thoughts ($p = .880$) and self-harm behaviours ($p = .192$) with the attention control PSHE programme.

Feasibility

A number of studies addressed feasibility of the interventions. The Signs of Self-Injury programme (Muehlenkamp et al., 2010) was described by participants as being straightforward and easy to use, with one person stating that it would be easiest to implement the programme at the start of the school year so it could be more easily integrated into the school curriculum. The classroom-based CBT (Stallard et al., 2013) was delivered by trained research assistants and the Mind and Body programme (Roberts et al., 2019) was delivered by practitioners trained and employed outside of the school environment. For the classroom-based CBT approximately half the students attended all nine sessions and 87% attended seven or more sessions. Engagement across the classroom-based CBT varied, facilitators and teachers liked the content of the programme, but reported that at times it was pitched more towards the younger students (year 8, aged 12–13) and may not have stretched the most able students. Teachers also raised concerns about the ability of less able students to engage with the classroom-based CBT. The Mind and Body programme (Roberts et al., 2019) did not report on feasibility of the intervention.

Of the six studies, four did not mention iatrogenic effects and two studies reported no iatrogenic effects (Baetens et al., 2020; Muehlenkamp et al., 2010), which could be taken as tentative evidence that directly addressing self-harm in the school environment does not appear to increase self-harm behaviour.

Quality of included studies

The quality of included studies was variable and mostly poor; five studies were rated weak (Argento et al., 2020; Baetens et al., 2020; Fukumori et al., 2017; Muehlenkamp et al., 2010; Roberts et al., 2019), and one study (Stallard et al., 2013) was rated moderate (see Table 4). Studies predominantly included single-arm non-controlled designs rather than randomisation, and therefore risked selection bias, with high dropout rates.

Table 4. Quality rating of included studies using the Effective Public Health Practice Project (EPHPP)

1st Author and year	Selection bias	Study design	Confounders	Blinding	Data collection method	Dropouts	Final rating
Argento 2020	Strong	Moderate	Weak	Weak	Strong	Moderate	Weak
Baetens 2020	Strong	Moderate	Weak	Moderate	Strong	Weak	Weak
Fukumori 2017	Weak	Moderate	Weak	Weak	Weak	Strong	Weak
Muehlenkamp 2010	Weak	Weak	Weak	Weak	Strong	Moderate	Weak
Roberts 2019	Weak	Weak	Weak	Weak	Moderate	Weak	Weak
Stallard 2013	Strong	Strong	Weak	Strong	Moderate	Strong	Moderate

Final rating: Strong (no weak ratings - green), moderate (one weak rating - yellow), weak (two or more weak ratings - red).

Discussion

Our primary finding is a lack of good quality evidence of how educational establishments can directly support school, college and university students who self-harm. Out of 4254 studies identified through searches, only six met the inclusion criteria. Three different interventions showed promise in reducing self-harm behaviours, as well as improving knowledge about self-harm and attitudes towards self-harm (Baetens et al., 2020; Muehlenkamp et al., 2010; Roberts et al., 2019). Across the in-classroom interventions student engagement was higher when the session included discussion and class activities (Baetens et al., 2020; Muehlenkamp et al., 2010). The interventions delivered by external agencies also seemed to be more effective (Argento et al., 2020; Roberts et al., 2019; Stallard et al., 2013). We only identified interventions in secondary schools and universities, but given a rise in reports of primary school children self-harming, evidence-based interventions addressing self-harming behaviours in younger age groups also need to be developed and evaluated. A further challenge to evidence synthesis is that all of the studies used a different outcome measure to record self-harm, making it difficult to compare across studies. In summary, the evidence base is very limited, both in size and quality.

Notably, studies included in this review mostly lacked an underpinning theory of change related to self-harm or included self-harm as a secondary outcome. The MRC complex intervention framework (Skivington et al., 2021) could provide a useful roadmap to self-harm intervention development. Uncovering the implicit theoretical basis of an intervention and developing a programme theory is essential to identifying key uncertainties and working out how the intervention might be evaluated. This supports the identification of mechanisms of change, important contextual factors and relevant outcome measures.

In health care settings, dialectical behaviour therapy (DBT) and cognitive-behavioural therapy (CBT) are used to treat adolescents who self-harm, including in-patient settings (Nawaz, Reen, Bloodworth, Maughan, & Vincent, 2021). However, few independently replicated randomised control trials (RCT) have been conducted to make conclusions about the effectiveness of these therapeutic interventions in health care settings (Kothgassner et al., 2021; Ougrin, Tranah, Leigh, Taylor, & Asarnow, 2012; Yuan, Kwok, & Ougrin, 2019), let alone in schools. Further, the application of CBT in the school context has not been promising (Stallard et al., 2014). Once a more substantive evidence base exists, the application of behavioural mapping and qualitative comparative analysis would identify the common components of

effective interventions to inform future intervention development and evaluation (Moore et al., 2018).

As set-out in the UK Government's green paper 'Transforming Children and Young People's Mental Health' (Department of Health, 2017), the school setting provides an opportunity to reach large numbers of young people simultaneously. Schools, colleges and universities are arguably more important for self-harm support given the low proportion of affected young people who seek help via health services. Furthermore, educational staff are often the first to be aware of self-harm in individuals and are very concerned about their role in supporting pupils with their mental health as well as mental health in pupils. Staff often have reservations about delivering interventions that specifically target self-harm due to potential for adverse consequences; universal interventions that address mental health more generally or are delivered by external experts may be more welcome, and appropriate (Evans et al., 2016). Among the three studies that reported a significant reduction in self-harm in our review, the interventions were delivered by people external to the schools and explicitly addressed self-harming behaviours (Baetens et al., 2020; Muehlenkamp et al., 2010; Roberts et al., 2019). This raises concerns about the outsourcing of pupils emotions and the potential for feelings of rejection. There is synergy in the teacher-student relationship which could be beneficial for those who self-harm. In two studies, the interventions were universal (Baetens et al., 2020; Muehlenkamp et al., 2010), and one was targeted (Roberts et al., 2019). Most students who self-harm will not access health care services, and support is needed in schools for both students and staff, particularly as mental health services have long waiting lists (Crenna-Jennings & Hutchinson, 2020). Training and tools to identify and manage self-harm specifically in schools have been created for teachers but whether or not these influence the outcomes for students is unclear (Pierret et al., 2020).

Adolescence is a time in which rapid social development occurs and young people become increasingly sensitive to peer's opinions (Nearchou et al., 2018), which raises the importance of peer support. In the Roberts et al study (Roberts et al., 2019) a mixture of 1:1 and group interventions were effective; Muehlenkamp et al.'s (2010) engagement of peers as a support mechanism was effective, and similarly YAM (Wasserman et al., 2015) was comparatively successful for suicidal ideation but did not measure self-harm. A next step could be to explore the relative success of the role of peers in self-harm and whether peer support might offer a route to reduce self-harm as well as risks to the peer supporters in terms of self-harm and their own mental

health. A literature review (Abou Seif et al., 2022) on peer support studies for self-harm showed a range of benefits including a sense of community, empowerment and access to information and support. The studies identified were online surveys and qualitative interviews. However, no study compared peer support with other treatments or a control group, limiting the conclusions that can be made about the effectiveness. Future research should also consider the burden on those participating in peer support and ensure adequate training and supervision, so peers are prepared and feel confident to support vulnerable people while maintaining their own emotional health.

Strengths and limitations of the study

This is the first systematic review of evidence for the effectiveness and feasibility of indicated self-harm interventions to improve outcomes for young people in school, colleges and universities, delivered to young people. Methodological strengths of the review include reproducible searches of both education and health literature, double screening of 10% of the title and abstracts, double screening of full texts, double data extraction with expert input and forward citation chasing.

The quality appraisals for five of the studies were rated as methodologically weak and the remaining study was rated moderate (Stallard et al., 2013). Many of the studies used single-arm non-controlled study designs and the outcomes measured varied with no established psychometric properties. Furthermore, not all studies measured the actual behaviour making it difficult to know how effective the interventions are, experts in the field of self-harm should refer to the MRC complex intervention framework and produce a consensus on appropriate methods and measures to study self-harm to decrease the heterogeneity among studies and to produce higher quality evidence.

We only included peer-reviewed quantitative studies but noted during the title and abstract screening stage many book chapters and unpublished theses addressed self-harm interventions in schools. We may have discarded some potentially effective interventions that might warrant further investigation, although given the weakness of the peer-reviewed literature, inclusion of grey literature seemed unlikely to add anything but confusion to the findings. The few interventions identified lack an empirical basis making it challenging to use the results to reliability inform practice.

Research in this field is impeded by differing perceptions of the position of self-harm in relation to suicidal ideation and behaviour, which might explain why existing school-based interventions with pupils, such as SEYLE and SOS, focus on suicidal ideation. Given the high prevalence of self-harm in individuals with suicidal ideations and behaviour, and the fact that self-harming often precedes a suicide attempt (Hawton & James, 2005), it is unfortunate these studies did not include a measure of self-harm.

Implications for future research

The findings from this review indicate that a great deal more evidence is needed to determine the effectiveness, and feasibility of interventions for schools and universities that directly address self-harm with young people,

although some classroom-based programmes show tentative promise.

Future studies should create unified definitions of student outcomes and use validated measures, even when interventions are indirect in terms of training teachers. Knowledge gain of teachers alone is insufficient to allocate limited time and resources when trying to understand whether said interventions are useful for students who are self-harming (Pierret et al., 2020). Few school-based self-harm programmes involve students when the evidence has shown students who self-harm are more likely to turn to peers for support instead of adults (Witt et al., 2020). Future research would be well served by looking at graduated responses to self-harm, a team around the child consisting of peers, teachers and professionals.

Conclusion

We reveal a huge evidence gap in the support of young people who are self-harming in educational settings. There is hope in terms of tentative evidence of reduced self-harm with some direct interventions, but future research needs a much improved theoretical and empirical basis to develop, evaluate and implement direct interventions with young people who self-harm.

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Author contributions

R.F.N. and T.J.F. conceptualised and designed the study with support from J.K.A. Literature searches were conducted by R.F.N. with support from J.K.A, R.F.N and L.C. screened the papers with support from J.K.A. R.F.N analysed the data with support from L.C, J.K.A and T.J.F. R.F.N took lead in writing the manuscript with critical feedback from J.K.A, C.F and T.J.F. All authors approved the final manuscript.

Ethical information

Ethical approval is not applicable to this article as no new data were created or analysed in this systematic review study.

Data availability statement

Data availability is not applicable to this article as no new data were created or analysed in this study.

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Supporting information

Additional Supporting Information may be found in the online version of this article:

Table S1. Search string for systematic review.

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