

Creating Hope Together

Scotland's Suicide Prevention Strategy 2022-2032



Evidence on School-Based Suicide Prevention Interventions

Report by: Dr. Banu Cankaya Sahin
Academic Advisory Group (AAG)
National Suicide Prevention Advisory Group

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Executive Summary

The evidence base for school-based suicide prevention interventions is promising, but concerns remain regarding the quality of evidence, limited number of replications, and the limited adaptation to different sociocultural contexts. More rigorous and large-scale studies are warranted.

Based on the conclusions of several reviews and evidence registries, interventions such as Youth Aware Mental Health (YAM), Signs of Suicide (SOS), and Sources of Strength are among the school-based interventions, with a growing evidence base. These interventions are typically universal, education-based programmes that promote awareness, coping, and help-seeking, often combined with components of gatekeeper training.

However, a recent English trial of YAM has shown that the impact of suicide prevention interventions is context-specific and unintended consequences can occur (Deighton et al., 2025). This may be related to implementation challenges such as school preparedness, programme acceptability, and overburdened school systems. This finding underscores the importance of conducting pilot research when implementing interventions in new contexts.

Pre-existing literature provides a critical perspective, suggesting key improvements when conducting school-based prevention interventions, including school preparedness including staff training, safety infrastructure, contextually tailored design using student-centred and whole-of school approaches, access to health care and follow-up supports, and ongoing monitoring and repeated evaluations of adapted interventions (Sharma et al., 2025).

What does this mean for Suicide Prevention Scotland

Although there is evidence for the effectiveness of YAM, the unintended negative effects of the English trial of YAM suggest that the impact of suicide prevention interventions can be context specific. This finding underscores the importance of conducting pilot research when implementing interventions in new settings to ensure their effectiveness and safety.

To mitigate unintended negative effects and to facilitate effective implementation, the following considerations draw on insights from the English trial, expert consensus as reported in a Delphi study, and suggestions from prior research. These recommendations can inform potential school-based initiatives in Scotland.

Key considerations	Facilitators/key actions
Research-led approach	• Universal, education-based programmes with gatekeeper components appear to have received more supportive evidence. • We need to recognise limits of evidence across contexts. • There is a need to conduct local research/trials to adapt and evaluate programmes.
Safety	• Harnessing existing school mental health culture and building a prevention framework appear important for effectiveness and safety. • Access to structured mental health care and follow-up procedures in/outside of schools, is needed to support at-risk students. • Supporting school staff to develop mental health literacy and appropriate responses in response to crisis, is recommended. • Monitoring impact of the programme can help identify and address unintended negative consequences.
Implementation effectiveness	• Prioritising school preparedness and capacity appears important for effectiveness. • Involving multiple school staff in delivery is recommended. • Inquiring about students' perspective and needs may increase engagement. • Applying a whole-of-school approach, considering the capacity and needs of staff, structure, school culture, and policy, can improve programme acceptability and preparedness.

Evidence on School-Based Suicide Prevention Interventions

The current report aims to answer the following questions.

- What is the latest evidence on school-based suicide prevention interventions?
- Which interventions have the strongest empirical support?
- What are the implications and insights for Suicide Prevention Scotland?

To answer these questions, this overview draws primarily on findings from systematic reviews and meta-analyses that evaluate the quality and effectiveness of school-based suicide prevention interventions, primarily focusing on suicidal thoughts and behaviour as the primary outcome and secondary school students as the sample. Studies conducted for primary school students only and university students only were excluded. The included reviews synthesise evidence across multiple individual studies, helping with an overall assessment of overall impact, quality, and consistency of findings.

Background

Suicide and non-fatal suicidal behaviours among young individuals remain a major public health problem across the world. Worldwide statistics show that suicide is a leading cause of death worldwide in this population, particularly for the age group between the ages of 15 and 29 as the third leading cause of death (World Health Organisation, WHO, 2025). In the UK, suicide rates have shown an increasing trend among young individuals, in particular among those aged between 15 and 24, young men were three times as likely to die by suicide as young women (RCPCH, <https://stateofchildhealth.rcpch.ac.uk/evidence/mental-health/suicide/#page-section-5>).

Higher rates of suicidal thinking and suicide attempts are consistently found in younger age groups. Global estimates on school-based health surveys of adolescents showed a past-year prevalence of 16.5% for suicidal ideation and 16.4% for suicide attempts among adolescents (Tang et al., 2020).

In England, the national statistics from the Adult Psychiatric Morbidity Survey: Survey of Mental Health and Wellbeing England 2023-2024 (Butt et al., 2025) show that suicidal thinking and suicide attempts are more common among younger populations aged 16-34 compared to older populations. Lifetime prevalences are similar for those aged 16-24 and 25-34, with approximately 32% for lifetime suicidal thinking and around 11% for lifetime suicide attempts. These figures are alarming given earlier findings suggesting up to one in three adolescents who experience suicidal thoughts may proceed to developing a suicide plan and attempt suicide (Nock et al., 2008).

Given the ongoing suicide risk among youth, schools are widely recognised as appropriate settings for prevention and treatment intervention and have been a focus of national suicide prevention strategies (US Department of Health and Human Services, 2024; Marshall et al., 2025; Sharma et al., 2024).

What are the different types of school-based suicide prevention interventions?

School-based suicide prevention interventions aim to reduce risk of suicide among young individuals through several types of interventions implemented in school settings (Sharma et al., 2024). These can include one or more of the following in combination;

- Universal programmes are educational programmes and skills building programmes delivered to all students, aiming to increase resources and encourage help-seeking. They typically involve psycho-education about mental health and warning signs of suicide, they provide guidance on how to seek and provide help, and involve training in coping and problem-solving skills
- Selective programmes are typically screening programmes that aim to identify those at risk for suicide followed by referrals, or gatekeeper programmes, involving adults and/or peers who are trained to identify individuals in distress and at risk of suicide and connect them to appropriate supports
- Indicated programmes are interventions that provide psychotherapy (e.g., cognitive-behavioural therapy, dialectical behavioural therapy, mentalisation-based therapy-adolescents) and targeted support for students who already demonstrate suicidal behaviour

A recent systematic review on suicide prevention programmes delivered to adolescents in non-clinical settings identified 41 distinct programmes across 53 studies (Poudel et al., 2025). Of these, approximately 15 programmes were exclusively school-based and implemented through curriculum-based classroom delivery. The remaining programmes consisted of group-level interventions that can be delivered in community settings outside of schools or class times. Among non-hospital-based programmes, 82% of the studies assessed effectiveness in relation to suicidal behaviours, 66.7% in relation to help-seeking, 93.8% in relation to knowledge on suicide, 81.8% in relation to attitude towards suicide, and 50% with respect to coping (Poudel et al., 2025).

Are school-based suicide prevention interventions effective?

Systematic reviews and meta-analyses provide promising results regarding the effectiveness of some school-based suicide prevention interventions, while concerns

remain related to the number, strength and quality of evidence (Brann et al., 2021; Gijzen et al., 2022; Kiran et al., 2024; Pistone et al., 2019; Marshall et al., 2025; Sharma et al., 2024; Walsh et al., 2022; 2023;).

A meta-analysis of 11 studies suggested that these interventions produce small but meaningful reductions in suicidal ideation and suicide attempts, with these effects persisting over 3 to 12 months (Gijzen et al., 2022).

Another meta-analysis of school-based suicide prevention programmes collating evidence across 329 schools and approximately 33,000 adolescents showed 13-15% decrease in likelihood of suicidal ideation and 28-34% decrease in the likelihood of suicide attempts, compared to no intervention (Walsh et al., 2022).

Furthermore, event-rate analyses suggested that per 20-25 students approximately one fewer adolescent may attempt suicide and per 47-55 students approximately one fewer adolescent may experience suicidal ideation following participation in these programmes (Walsh et al., 2022). These effects were reported to be comparable to those found in emergency care interventions (Miller et al., 2017; Walsh et al., 2022).

Walsh et al. (2022) further suggested that larger reductions in suicide attempts were demonstrated in studies where interventions were delivered within less than a week, involved multiple school personnel (e.g., counsellors, teachers) and included a 12-month follow-up assessment.

Which “type” of intervention is more effective?

Evidence on the relative effectiveness of universal, selective and indicated approaches to school-based suicide prevention remains mixed (Kiran et al., 2024; Pistone et al., 2019; Sharma et al., 2024). Earlier evidence suggests that school-based educational and awareness-raising interventions are effective in reducing suicidal thoughts and suicide attempts, particularly when compared to gatekeeper-only approaches (Pistone et al., 2019). More recent evidence provides cautionary notes and mixed conclusions (Kiran et al., 2024; Sharma et al., 2024).

Sharma et al. (2024) provided a Cochrane systematic review, and concluded that evidence is inconclusive, with “very uncertain” evidence for universal and selective interventions and “low-certainty” evidence for indicated interventions. The lack of certainty reflects the challenges in this field of study, including the diversity of universal interventions, variation in measures, a small number of targeted interventions, and limited repeated trials (Poudel et al., 2025; Sharma et al., 2024) and Sharma et al.’s review also pointed to the concerning

findings that confidence intervals show both harm and benefit at the end of prevention interventions.

Kiran et al. (2024), on the other hand, conducted network meta-analysis using broader inclusion criteria and found that universal education and awareness programmes were associated with roughly 30-35% reductions in suicidal thoughts and behaviours. Psychotherapy programmes for at-risk individuals showed even larger impact (around 50%) in suicidal thoughts and behaviours compared to no intervention.

Participation in universal gatekeeper training (i.e., training delivered to all members of school community to identify and refer students at risk for suicide to mental health providers) showed the largest impact in increasing suicide prevention competencies, such as increased help-seeking, improved attitudes, and suicide-related knowledge. Selective gatekeeper training (i.e., training provided to only those who are more likely to encounter youth with suicidal thoughts and behaviours) showed moderate improvements in increasing suicide prevention competencies (Kiran et al., 2024).

The analysis further suggested that school students may benefit more than university/college students from universal programmes designed to increase suicide-related knowledge and help-seeking behaviour. Also, the findings suggested that interventions are generally more effective when pupils, in particular those at risk for suicidal thoughts and behaviours, are actively involved in the suicide prevention intervention, rather than when the intervention is delivered to the school staff alone (Kiran et al., 2024).

Overall, while some approaches show promise, firm conclusions are limited by high variability on study designs and quality, highlighting the need for more high-quality and repeated studies on school-based prevention interventions.

Which interventions are more effective?

Current evidence shows mixed yet promising directions for several school-based suicide prevention interventions (Marshall et al., 2025; Poudel et al., 2025). There is no one-size-fits-all approach, and evidence on specific interventions and adaptations to different contexts still remain limited, with variable interpretations of evidence quality (Clarke et al., 2021; Kutcher et al., 2017; Liljedahl et al., 2023; Poudel et al., 2025; Sharma et al., 2024).

Among the interventions evaluated for secondary school students, Youth Aware Mental Health programme (YAM; Wasserman et al., 2015), Signs of Suicide (SOS; Aseltine et al., 2007; Aseltine & DeMartino, 2004; Schilling et al., 2014; 2016), and Sources of Strength programme (Petrova et al., 2015; Cleave et al., 2022; Pickering et al., 2022; Wyman et al.,

2024) have been highlighted in systematic reviews or cited in evidence registries for showing the most evidence of impact in terms of suicidal outcomes (i.e., having been evaluated in a large-scale study or multiple studies). These interventions are universal programmes with gatekeeper components.

Youth Aware Mental Health programme (YAM)

The Youth Aware Mental Health (YAM; Wasserman et al., 2015) programme stands out among school-based suicide prevention programmes because its effectiveness has been supported in one of the largest trials across Europe - The multicentre Saving and Empowering Young Lives in Europe (SEYLE). The SEYLE study had a sample size of 11,110, in 168 schools across 10 European countries.

The YAM was designed as a universal school-based prevention and is a manualised programme that is delivered over three weeks, for five hours in total, as classroom lessons. It aims to increase knowledge on suicide and depression, raise awareness of protective and risk factors for suicide, and increase skills in recognising and responding to depression and suicidal thoughts in themselves and others. YAM combines lectures, role-play, and discussion to increase awareness of mental health, coping skills, and help-seeking.

According to a review on student-directed school-based suicide prevention programmes evaluated using the STANDUP Act criteria, YAM was one of the two programmes with the highest level of evidence for reducing suicidal thoughts and behaviours (Krantz et al., 2024). The STANDUP Act (i.e., Students, Teachers, and Officers Prevention (School) Violence and Suicide Act) is proposed by US federal law and provides funding and support to schools and districts. It aims to improve school safety and improve access to evidence-based health and suicide prevention programmes.

YAM has shown effectiveness in reducing suicidal ideation and depressive symptoms in secondary schools in Australia (McGillivray et al., 2021) as well as improving help seeking, mental health literacy and stigma in the US (Lindow et al., 2020).

However, a recent trial funded by the Department for Education has produced largely negative findings regarding its effectiveness in secondary schools in England. Some students who took part in YAM showed short-term reductions in emotional difficulties, while reported emotional difficulties increased at 9- and 12-month follow-ups. As a result, the authors recommended against the use of YAM in English secondary schools until further research clarifies how to overcome longer term risk for students (Deighton et al., 2025).

For more details about this intervention and effectiveness studies, please see Appendix 1.

Signs of Suicide (SOS) programme

SOS programme (Aseltine et al., 2007; Aseltine & DeMartino, 2004; Schilling et al., 2014; 2016) is a primarily curriculum-based universal intervention for middle and high school students in the US, which also integrates components of selective and indicated prevention. It combines psychoeducation with screening and follow-up support, with follow-up often involving school mental health professionals (<https://mentalhealthscreening.org/programs/youth-prevention-programs/sos/>).

The SOS programme (Aseltine et al., 2007; Aseltine & DeMartino, 2004; Schilling et al., 2014; 2016) is one of the two programmes that was promoted under the STANDUP Act criteria (Krantz et al., 2024). It has been included in several registries (<https://mentalhealthscreening.org/programs/youth-prevention-programs/sos/>), such as the Best Practices Registry in Suicide Prevention Resource Center (<https://bpr.sprc.org/program/sos-signs-of-suicide/>), and was previously listed in the Substance Abuse and Mental Health Services Administration (SAMHSA) National Registry of Evidence-based Programs and Practices (NREPP; discontinued in 2018), where it received a rating of “promising” evidence (i.e., evidence is not strong enough to be designated as an effective intervention).

Originally SOS was developed as a non-profit initiative in Wellesley, Massachusetts, sponsored by fifteen national organisations. The SOS programme and its materials are now available for purchase online along with some materials accessible for families, through MindWise Innovations (<https://bpr.sprc.org/program/sos-signs-of-suicide/>).

Overall, however, there is no consensus on the quality of evidence supporting the effectiveness of SOS (Kutcher et al., 2016; Wei et al., 2015), while the recent systematic reviews suggested SOS as the more effective school-based suicide prevention interventions, with moderate effectiveness in reducing suicide attempts (Marschall et al., 2025; Poudel et al., 2025). Kutcher et al. (2017) raised concerns about the use of the SOS programme in schools in Canada and highlighted inadequacy of evidence supporting its efficacy and safety. They argued that the lack of evidence for reductions in suicidal thinking is counterintuitive given significant reductions in suicide attempts. Furthermore, they pointed to an increase in suicide attempts among some students in the intervention group, which was not discussed by Schilling et al. (2014).

For more details about this intervention and effectiveness studies, please see Appendix 1.

Sources of Strength Programme

The Sources of Strength programme (Wyman et al., 2010; Petrova et al., 2015; Caelear et al., 2022; Pickering et al., 2022; Wyman et al., 2025) was the second most studied programme,

after the SOS, according to evidence available up to 2024 according to Poudel et al. (2025). It is grounded in a network model and is a universal, peer-led programme that promotes coping skills and help-seeking by trained influential peer leaders and students who model healthy coping behaviour and encourage help-seeking from trusted adults.

Most evidence supports its impact on help-seeking and student-adult connections (Wyman et al., 2010; Petrova et al., 2015; Caelear et al., 2022), with effectiveness influenced by how well peer leaders are connected to student networks (Pickering et al., 2022). Emerging evidence suggests promising results in reducing suicide attempts over 18 months (Wyman et al., 2024), and possible reductions in suicide death (Wyman et al., 2023), although findings remain inconsistent.

For more details on the content of the programme and effectiveness studies, please see Appendix 1.

Further examples of different types of school-based programmes

To name a few other school-based suicide prevention programs designed for secondary school students, the following are examples of educational school-based programmes with less robust evidence (Krantz et al., 2024; Poudel et al., 2024).

- Surviving the Teens programme (4 45-minute sessions, conducted by facilitators, on depression and suicide risk, coping, help-seeking, and recognizing signs of suicide; King et al., 2011; Strunk et al., 2024), evaluated as very low evidence by Krantz et al.
- Headstrong (10 hour over 5-8 weeks, facilitated by teachers, on mood disorders and help-seeking for self and others; Perry et al., 2014), evaluated as moderate evidence
- Teen Mental Health First Aid (tMFHA; Hart et al., 2020), evaluated as low evidence by Krantz et al.
- South Elgin (Ciffone 1993; 2007), evaluated as moderate evidence by Krantz et al.
- Adolescent Depression Awareness Program (Swartz et al., 2010, 2017; Townsend et al., 2019; Beaudry et al., 2019), with moderate evidence by Krantz et al.
- Another example is Yellow Ribbon programme (Freedenthal, 2010; Flynn et al., 2016; <https://yellowribbon.org>), which combines gatekeeper components with psychoeducation, aiming to increase knowledge and alertness to signs of suicide risk among staff and students and encourage help-seeking. Students receive yellow “Ask for Help” cards as prompts, where they can write down a trusted adult’s name.

An example of a selective programme is the Empowering a Multi-modal Pathway toward Healthy Youth (EMPATHY; Silverstone et al., 2015; 2017) project. EMPATHY is a large school-based program that combines universal screening for depression and suicidal risk, targeted CBT, and referral support.

An example of (universal) gatekeeper training programmes is SafeTALK programme, which involves half-day training aiming to improve recognition and response to signs of suicidal distress including connecting individuals at risk with appropriate supports (Bailey et al., 2017; Kinchin et al., 2019). Bailey et al. (2017) provided evidence for its effectiveness in decreasing suicidal ideation right after the programme and increasing help-seeking in 1-month follow-up. However, those who presented with suicidal ideation prior to the programme reported being upset with the intervention. Kinchin et al. (2020) provided evidence on effectiveness of SafeTALK in increasing intention and willingness for help-seeking among secondary school students.

Examples of interventions for indicated programmes include Counselors Care: Assess, Respond, Empower (C-CARE, Thompson, Eggert, Randell & Pike, 2001) and Coping and Support Training (CAST, Thompson et al., 2001) were designed as an indicated preventive intervention to support youth at risk of suicide (i.e., high-school drop-outs), combining assessment, counselling, and skills-building.

How to mitigate unintended adverse consequences in school-based suicide prevention interventions?

Unintended consequences of suicide prevention interventions in schools are rarely and not systematically assessed, although some studies have reported adverse effects such as increased distress and reduced help-seeking (Bailey et al., 2017; Deighton et al., 2025; Kalafat & Elias, 1994; Kuiper et al., 2019). For example, pre-existing suicidal ideation was found to be associated with finding a gatekeeper training programme upsetting (Bailey et al., 2017). In their Cochrane review on suicide prevention interventions in educational settings, Sharma et al. (2025) highlighted concerns related confidence intervals that indicate the potential for such interventions to increase suicidal thinking and behaviour among some students. Recent findings from the YAM trial in England indicated increased emotional difficulties among students who participated in YAM compared to controls (Deighton et al., 2025).

Adverse unintended consequences may extend beyond individual level to staff and the wider system, with teachers reporting overburdened and the school and mental health services may be strained where organisation is not prepared well enough for the intervention. For example, a study showed that referrals for mental health services declined following a gatekeeper program until 60% of school personnel were trained (Goldston & Walrath, 2021; Wyman et al., 2015). Concerns also have been raised that stress-based frameworks in some universal programmes may risk normalizing suicidal thinking and behaviours as a natural consequence of distressing events (Portzky et al., 2006; Sharma et al., 2025).

To mitigate risks, evidence emphasises the importance of **organisational preparedness**, including **readiness of mental health care infrastructure** in coordination within wider mental health care system and **staff training** in mental health literacy, appropriate responses and referral strategies, (Kuiper et al., 2019; Ostergaard et al., 2024). **Continuous monitoring and evaluation** during and after implementation are also essential to identify negative effects across students, families, adults, staff, and broader system levels.

Findings from YAM implementation further highlighted that limited school preparedness, including weak integration of programme with school structure and staff, inadequacy of already existing supportive services and perceived burden on the curriculum may have contributed to unintended consequences (Deighton et al., 2025).

Furthermore, a Delphi study on expert consensus provided the following recommendations; 1) using **evidence-based** approaches, 2) following **safe communication guidelines**, 3) following procedures to ensure **access to treatment**, 4) planning **a long-term school response** to suicidal behaviour, 5) **tailoring prevention programs** specifically to context such as the unique features of the school system, staff profile, and student population and 6) incorporating suicide prevention within **broader prevention programmes** (Grosselli et al., 2021).

Conclusion and discussion

Overall, while inconsistencies across reviews and low-quality evidence are noted, current evidence shows that school-based prevention interventions are promising, but not universally effective, with limited data on how programmes work across different contexts (Kiran et al., 2025; Marshall et al., 2025; Pistone et al., 2019; Sharma et al., 2024; Walsh et al., 2022).

With respect to the specific types of interventions, while acknowledging the limitations of research evidence in this field, Kiran et al. (2024) showed promising evidence for the use of universal education and awareness raising programmes and psychotherapy, showing evidence in reducing suicidal thoughts and behaviours, and the use of universal or selective gatekeeper programs along with education-based programmes, in increasing suicide prevention-related competencies (e.g., suicide knowledge).

Findings are less conclusive with respect to which specific interventions work best for whom. Among specific interventions evaluated among secondary school students with respect to suicidal outcomes in particular, YAM, SOS and Sources of Strength programmes appear to provide more evidence in favour of their effectiveness, while inconsistencies in evidence remain. They share certain features in that they are universal education-based programmes which focus on education, raising awareness, improving attitude, recognizing

signs/symptoms of suicide and mental distress (e.g., depression, substance use), and encouraging help-seeking.

However, the results of the trial in England have shown that an effective intervention (i.e., YAM) leading to 50% decrease in suicide risk across Europe may not be similarly effective in another context (i.e., leading to increasing reports of emotional difficulties, in England; Deighton et al., 2025). This finding highlights the importance of safety procedures and testing interventions that are implemented in new contexts.

Based on expert opinion and insights gained from prior research, actions to keep school-based suicide prevention strategies safe and effective may include; 1) continuous monitoring and assessment of intervention effects during and after the intervention and across all levels, including students, school staff, teachers, facilitators, and wider school system, 2) involving multiple stakeholders, students and multiple school personnel in particular, in designing and implementing interventions, to respond to their needs, 3) embedding school-based interventions in wider prevention interventions and mental health support and care system to ensure safety and longer term impact, 4) applying structured protocols to follow up and refer students at risk, 5) taking a whole-of-school approach, 6) facilitating school preparedness by training staff in mental health literacy and how to help those at risk and developing school infrastructure to match the needs of the intervention.

In summary, the current evidence base highlights the need for carefully designing school-based suicide prevention interventions to thwart unexpected negative consequences. While most evidence points to the potential effectiveness of universal education-based programmes in reducing suicide risks among secondary school students, for targeted and research-led recommendations about which interventions are more effective and safer in specific contexts, there is a need for larger and methodologically more robust trials (e.g., RCTs, mixed design studies) and research examining socio-cultural adaptations.

Limitations and future directions for implementation and research

Looking forward, there is a need to build the evidence base to arrive at firmer conclusions about effectiveness school-based interventions (Clarke et al., 2021; De Oliveira et al., 2023; Poudel et al., 2025; Sharma et al., 2025; Walsh et al., 2022; 2023; Marschall et al., 2025). Evidence base can be improved by conducting 1) **high-quality studies including large replication studies**, 2) **qualitative or mixed studies to explore acceptability, needs, and reflections**, and 3) **trials for socio-cultural adaptation in different countries and cultural groups**.

Walsh et al. (2023) in their systematic review focused on contextual factors in school-based suicide prevention programmes suggesting that what is missing, has been **the lack of collaboration with stakeholders, adolescents and school personnel in particular, in designing, implementing, and examining school programmes.**

Sharma et al. (2024) also highlighted additional, yet related considerations including **the acceptability of the programmes** by young individuals, families, and school staff, to include **student perspective in designing and delivering interventions and designing outcomes that are of interest to the students**, and being cautious about potential negative effects (i.e., increasing suicidal ideation and suicide attempts). In their inquiry, students considered development of coping skills and building safer environments. **Adaptations to specific school settings** and particularly in poorly resourced environments is important in making an effective implementation. **Whole-of-school approaches** are missing from the implementation of these interventions and integration of these programmes into the school culture is still to be explored.

Furthermore, **studies on cost-effectiveness** are warranted (Marshall et al., 2025).

With respect to practical considerations, ensuring readiness through adequate preparation, staff training, and coordinated support systems appear key to safe and effective implementation of school-based interventions (Kuiper et al., 2019; Ostergaard et al., 2024). Programmes should be co-developed with adolescents and may benefit from involving families and school staff to ensure acceptability (Aoun et al., 2024; Kiran et al., 2025; Sharma et al., 2025; Walsh et al., 2022; 2023). Embedding interventions within wider prevention framework and wider mental health support systems, alongside ongoing monitoring and follow-up, appear essential to minimize potential risks (Grosselli et al., 2021; Ostergaard et al., 2024).

Key Take Aways

Evidence from pre-existing studies suggest that school-based suicide prevention interventions are promising, but effectiveness may vary across contexts. The mixed quality of the studies begets further research and increasing the number of evaluations and repeated tests of effectiveness across different contexts, with larger samples and better-quality design.

Specific interventions such as YAM, SOS, and Sources of Strength appear to have a comparatively stronger evidence base. These interventions are universal, education-based programmes that incorporate components of gatekeeper training. They differ with respect to the delivery format (e.g., SOS uses video-based dramatisations), delivery leads (e.g. Sources of Strength is led by peers, YAM is led by trained facilitators), and follow-up

procedures (e.g., SOS includes a standardized follow-up procedure). However, effectiveness of these interventions has been questioned with respect to the quality of evidence and a lack of sociocultural adaptation, as has been the finding for YAM trial in England, which showed unintended consequences while it was associated with a reduction in suicide risk by 50% in a large European trial (Deighton et al., 2025).

What does this mean for Suicide Prevention Scotland?

Key insights from the English trial, expert opinion, and pre-existing reviews providing a critical perspective on school-based interventions provide the following suggestions for increasing safety and effectiveness of school-based interventions:

Key domains	Facilitators/key actions
Research-led approach	• Prior research shows that universal, education-based programmes with gatekeeper components appear to show promise in reducing suicide risk among secondary school students. • Prior research is informative yet may not fully apply to all contexts (see findings of YAM trial in England). • New research trials must be conducted to adapt and evaluate programmes tailored to new environments • Mixed study designs, collecting both quantitative and qualitative data, would help examine and understand the impact of the intervention.
Safety	• A mental health promotion and prevention culture in schools can create the right circumstances for suicide prevention interventions. • Integration of intervention within a structured mental health care system, alongside clear follow-up procedures in/outside of schools is essential to ensure appropriate support and safety for at-risk students. • School staff training in mental health literacy can help in creating a psychologically safe school environment and help students to reach out for support when they need it. • Ongoing monitoring and evaluation of programme's impact on students, staff, implementers, and the wider school system is

	essential to foresee and mitigate unintended negative consequences.
Implementation effectiveness	• Prioritising school preparedness is crucial for programme acceptability, effective implementation and longer-term impact. This can include: ○ an assessment of school's capacity and infrastructure to meet implementation needs ○ involving as many school personnel as possible was advised for effective implementation and effectiveness. ○ staff training in mental health literacy and strengthening mental health care service infrastructure within and outside of the school systems. • Student-centred design is recommended. This ensures alignment with students' values and can increase engagement. Related action is to hear their perspective in guiding the design and outcomes targeted by the intervention. • Whole-of-school approach can improve programme acceptability and preparedness. This includes considering personnel, existing schooling structure, school and student culture, and wider school policies in designing and implementing the intervention.

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Appendix 1

Table 1. Examples of school-based suicide prevention interventions

Reference	Programme	Population	Type of intervention	Delivery and content	Evidence summary
Aseltine & DeMartino (2004)	<i>Signs of Suicide (SOS)</i> suicide prevention program	Middle and high school students; School-based suicide prevention program, delivered as a classroom lesson along with suicide screening and follow-up referrals	Universal, curriculum-based programmes, involving psycho-education and self-screening for depression and suicide	Multi-modal (digital, group, face-to-face) teaching materials administered by trained teachers, 2 days duration. Education-component: A video drama (Friends for Life) and accompanying discussion guide are used to teach students about the signs of suicide and depression, and how to respond appropriately using ACT action plan (i.e., Acknowledge, Care, Tell). The video includes dramatised scenarios and interviews depicting real life stories. Students are provided with self-screening instruments for depression to encourage help seeking from trusted adults and	Studies have shown overall moderate effectiveness in reducing suicide re-attempts, suicide knowledge, and attitudes towards suicide (Aseltine et al., 2007; Robinson et al., 2016; Schilling et al., 2014) and increasing help-seeking (Aseltine et al., 2003; Aseltine & DeMartino, 2004; Aseltine et al., 2007).

				other signposted sources of support. Students go through a structured follow-up procedure if they present with suicidal ideation and behaviour. This includes including comprehensive risk assessments, safety planning, contact with families, and referral for further treatment, by school mental health professionals.	
Wyman et al. (2010)	<i>Sources of Strength program</i>	School-based suicide prevention program delivered by peer leaders; is a <i>universal prevention intervention programme</i>. Under the supervision of adults, student peer leaders are educated in, and disseminate a	Peer-led schoolwide program Psychoeducationa, aiming to increase coping skills and sources of strenght, includes campaign on reinforcing help-seeking from trusted adults	Face-to-face, group, campaigns; certified trainers train adult advisors, school teachers and peer leaders; trained peer leaders are supervised by trained adult advisors; 1-hour orientation to school staff; Delivery ranges between 40-45 minute sessions to one 4-hour training for peer leader and adult advisors, structured around 15 modules focused on improving 8 protective	Program improved schoolwide attitudes toward help seeking and student help-seeking behaviours such as referring suicidal friends to adults (Wyman et al., 2010). Impact on suicidal behaviour was more consistent when adults supervised peer leaders (Wyman et al., 2023). In a recent study, the intervention was shown to reduce the likelihood of new suicide attempts by about 29% over 18 months.

		multidimensional coping framework using their peer networks. Additionally, school-wide prevention campaigns enable the dissemination of the framework to larger audience.		factors named as “sources of strength”; and identifying and engaging “trusted adults” for suicide help-seeking	Students from diverse backgrounds and those with sexual harassment history showed benefits, while students with recent sexual contact victimization benefited less (Wyman et al., 2024).
Wasserman et al. (2015)	Youth Aware Mental Health (YAM) programme	Secondary schools; a school-based prevention program that is based on increasing awareness on mental health and suicide, and building coping skills.	Universal classroom-based suicide prevention curriculum <i>Universal component:</i> Psychoeducational, awareness raising and increasing coping skills and help-seeking behaviours <i>Selective component:</i> Gatekeeper training via QPR and screening via ProfScreen	A 5-hour curriculum-based programme delivered over 3-5 sessions with students in classrooms, includes interactive workshops (i.e. role-play, discussions), organised around themes including; 1) awareness of mental health, 2) stress and how to handle crises, 3) depression and suicidal thoughts, 4) how to help oneself, 5) how to help a friend, 6) seeking advice and knowing who to contact. Overall, the focus is on mental health education and increasing coping and help-seeking	A large trial (n= 11,110) conducted across 168 schools in 10 European countries, SEYLE, found that students who participated in YAM were about half as likely to attempt suicide or experience severe suicidal ideation over 12-month follow-up period, compared with those in the control group. Roughly 0.7% of students in the YAM group reported a suicide attempt during the follow-up compared with the 1.5% in the control group. Similar percentages were observed for severe suicidal thoughts

				behaviours including provision of help to friend who might need help in mental health or suicidal crisis.	Question, Persuade and Refer (QPR) and professional screening (ProfScreen) did not show similar effectiveness. (Wasserman et al., 2015). However, a recent trial in English secondary schools showed that it may not be safe to implement YAM in England. Students who participated in YAM showed increased in emotional difficulties i at 9- and 12-month follow-ups (Deighton et al., 2025).
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Table 2. Studies on secondary school-based suicide prevention interventions that appear to have more evidence base

Intervention	Author/s (year) Country	Setting	Sample	Study Design	Comparison group	Primary outcome – Suicide related outcome(s)	Longest follow-up	Findings
<i>Signs of Suicide (SOS)^a</i> suicide prevention program								
	Asettine et al. (2003) USA	Middle and high school students; 92 schools and 68 schools in follow-up	School staff and students	Survey	N/A	Evaluations on feasibility and safety of implementation: Self-reported help-seeking behaviour; Rates of help-seeking from counselling center; Staff perspective on costs and benefits	Post-intervention	Access to counselling for depression and suicide: Average number of students accessing counselling for depression and suicidal thoughts increased from 6.79 per month to 10.63 after the month of implementation.

								Help-seeking behaviour: Students reported an increase of nearly 60% in help-seeking behaviour compared to previous year. Other outcomes: <i>Costs and benefits:</i> According to the perspective of staff, 19% adverse effect; 88% (somewhat to very helpful)
	Aseltine & DeMartin o (2004) USA	High school students (N = 5)	N (Control group) = 1073; N (Treatment group) = 2017	RCT; 2 year study	Control group	Suicide attempts and suicidal ideation (YES/NO; single item from Centers for Disease Control and Prevention Youth Risk Behavior Survey) Knowledge and attitudes about depression and suicide	3 months post-intervention	Suicide attempt: The intervention group reported significantly less suicide attempts (3.6%) compared to control group (5.45%). Intervention group was about 40% less likely to report a suicide attempt in the past 3 months, compared to control group (coefficient = - 0.467)

						Help-seeking behaviour		Suicidal ideation: Not significant. The intervention group demonstrated less suicidal ideation but not reaching statistical significance. Help-seeking: Not significant No significant differences in help-seeking were demonstrated Other outcomes: The intervention group reported significantly higher <i>suicide knowledge, improved attitude</i>, compared to control group. .
	Aseltine et al. (2007)* USA replication and extension	High school students; Schools (N) = 9	N = 4133; 50% male, N (Treatment group) = 2309, N (Control	RCT	Control group received the program after the study period	Same as above	3 months post-intervention	Suicide attempt: 3% of students in the intervention group reported a suicide attempt, compared with 4.6% in the control group.

	n of earlier study USA		group) = 2094					Students who received the intervention were approximately 40% less likely to report a suicide attempt within the past 3 months (beta = - 0.47 (SE 0.16), $p = 0.0075$; OR = 0.47). Suicidal ideation: Not significant 10.1% of students in the intervention group reported suicidal ideation compared to 11.5% in the control group. This was not statistically significant.
	Schilling et al. (2014) USA	Middle school students N (schools) =8	N = 470, 47.4% male;	Random sequence generation method: Cluster simple randomisation; (2 schools allocated to control crossed	Waitlist control: Control group received the program after the study period	Same as above	3-months post-intervention	Suicide attempts: Impact could not be examined because of small number of attempts. ** Suicidal ideation or planning: No significant impact Among students in the intervention group, who had reported suicidal ideation at the

				over to intervention; blinding procedures were not reported)				pretest had a significantly lower likelihood of engaging in any suicidal behaviour (ideation, plan, or attempt) in the past three months, compared to those in the control group, after accounting for attempt history; contract effect = -3.28; OR = 0.038. This was reported to indicate 96% less likelihood of reporting any suicidal behaviour 3 months post-intervention among those who participated in the SOS intervention, compared to those in the control group, ($OR = e^{-3.28} = .038$, $t(341) = -2.03$, $p < .05$). Help-seeking: No significant changes in help-seeking from family or friends. Other outcomes: Students in SOS intervention showed greater knowledge
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								about depression and suicide; with an effect size of 2/5 (small to medium) <i>of a standard deviation (e.g., .53/1.31 = .40, $p < .05$).</i> Attitudes: No significant impact
	Schilling et al. (2016) USA	Ninth grade students from secondary schools (N = 17)	N = 1272; ages between 14 and 15; 58.3% male; Treatment group (N) = 719; Control group (N) = 553	Random sequence generation method: Cluster simple randomisation; Less than 15% drop-out rate	Waitlist control (assessment only until the second semester)	Suicidal ideation as measured by CDC, YRBS)	Post-intervention only	Suicide attempts: After adjusting for baseline reports of lifetime and recent attempts, students in intervention group were 64% less likely to report a recent suicide attempt than those in the control group in the past 3 months, $b = -1.02$, $p > 0.05$; $OR = e^{-1.02} = 0.36$. 1.7% students in the intervention group reported suicide attempt during the past 3 months compared to 5% in the control group. Suicidal ideation and planning: No significant impact

								Subgroup analysis - Suicide planning: Program may be particularly effective at reducing future suicide planning among those already at high risk: Those with a prior history of suicide attempts in the intervention group, were significantly less likely to report making suicide plans compared to their lower-risk counterparts. Other outcomes: Positive findings regarding greater <i>knowledge of depression and suicide</i>, more adaptive <i>attitudes</i>.
Sources of Strength Programme ^b								
	Wyman et al. (2023) USA	N = 78 high schools	N = 40,747 students	Pooled analysis from 3	Wait-list condition	Suicide deaths	Varied	Suicide deaths: No students died by suicide in schools that used the programme,

				cluster RCT				compared to 4 suicides occurred in schools that had not yet introduced the programme. *The significance varied depending on the analysis employed.
	Wyman et al. (2024) USA	N = 20 high schools	N = 6,539 students	Cluster RCT	Control schools	Suicide attempt	6-month, 12-month, 18-month	Suicide attempts: 29% reduction in new suicide attempts over follow-up were shown in intervention schools (9% in intervention schools vs. 11% in control schools) Sub-group analysis: Students with a recent history of sexual contact victimisation remained at high risk for suicide.
<i>Youth Aware Mental Health (YAM) programme</i>								
	Wasserman et al. (2015) 10 European	All students participating in classroom learning	N = 11,110; mean age = 14.8 (SD = 0.82)	Cluster RCT; 3 treatment groups (YAM, QPR-gatekeeper	Active placebo: control group received 6 educational posters,	Suicidal ideation and SA (YES/NO) using the Paykel Hierarchical Suicidal Ladder	12-months	Suicide attempts: Among the active intervention programmes, YAM was associated with a statistically significant

	Countries	N = 11,110; mean age = 14.8		er program, ProfScreen – screening by health professionals)	similar to YAM intervention, including local help resources.			decrease by about 50% in suicide attempts. Other programmes were not associated with significant changes in suicide attempts QPR: OR = 0.70 (0.39–1.25), YAM: OR = 0.45 (0.24–0.85), ProfScreen: OR = 0.65 (0.36–1.18)
	McGillivray et al. (2021) Australia	Secondary schools across New South Wales; (N = 76; 18 agreed for evaluation)	Year 9 students, ages between 13 and 16, N = 2,85, 556 consented	Pre- and post-intervention study design	N/A	Suicidal ideation and suicide attempt measured via items in Paykel's Suicidal Feelings in the General Population Questionnaire	3- months and 6- months	Suicide attempt: Not clear, reports were inconsistent, across different assessments, overall higher incidence rate at baseline (4%) Suicidal ideation: Change in suicidal ideation scores from pre-intervention to 3-month and 6-month follow-up interventions was significant. Help-seeking: No significant change across the follow-up assessments

								Depression: Significant reductions were reported across 3- and 6- month follow-ups Others / Suicide literacy & Suicide stigma: No significant change across the follow-up assessments
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Note. ^a Evidence is equivocal because of inconsistencies in findings and poor quality – while several reviews and evidence registries list SOS as an intervention with some evidence, Kutcher et al. (2017) and Wei et al. (2015) critically comment against its effectiveness.

^b Initial evidence for Sources of Strength Model was provided by Wyman et al. (2010), Petrova et al. (2015), and Caelear et al. (2022), and this evidence is based on programme’s effectiveness on improving help-seeking for self and others, evidence evaluated as moderate level under the STANDUP Act per LEGEND system.