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Controlled Interventions to Improve Suicide Prevention in Educational Settings: A Systematic Review and Network Meta-Analysis

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Background: Suicidal thoughts and behaviors (STBs) in young people is a major public health problem, which is on the rise globally. **Aims:** We applied the first network meta-analyses to examine the effectiveness of existing intervention types and contents to reduce STBs and improve suicide prevention competencies in educational settings. **Method:** We searched Medline, PsycInfo, and CENTRAL until April 2021. Quantitative studies focused on young people aged between 12 and 25 years which evaluated interventions at educational settings and contained comparator groups were included. **Results:** Overall, we identified 49 studies comprising 42,039 participants. Regarding the type of intervention, universal interventions ($OR = 1.85$, 95% confidence interval [CI] [1.43–2.38]) were associated with almost two-fold reductions in the odds of STBs. Selective (standardized mean difference [SMD] = 0.51, 95% CI [0.32–0.70]) and universal interventions (SMD = 0.40, 0.26–0.54) were moderately effective in increasing suicide prevention competencies. Regarding the content of the intervention, education/awareness programs ($OR = 1.59$, 95% CI [1.23–2.04]) and psychotherapy programs ($OR = 2.22$, [1.25–3.33]) were associated with 1.5- and two-fold reductions in the odds of STBs. Gatekeeper universal interventions (SMD = 1.04, 95% CI [0.73–1.34]) and gatekeeper selective interventions (SMD = 0.52, [0.26–0.77]) were strong-to-moderately more effective in increasing suicide prevention competencies when compared to no-treatment. *Education/awareness* interventions were also modestly effective (SMD = 0.28, 95% CI [0.12–0.44]). The quality of 81% of the included studies was low. **Conclusions:** Important policy actions should be taken with a

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Ioannis Angelakis served as lead for formal analysis, methodology, and writing—original draft. Maria Panagioti contributed equally to data curation and supervision. Alexander Hodkinson served as lead for formal analysis and software. Tayyaba Kiran, Ioannis Angelakis, Maria Panagioti, Nusrat Husain, Nasim Chaudhry, and Alexander Hodkinson contributed equally to conceptualization. Tayyaba Kiran, Maria Panagioti, Sehrish Irshad, Rabia Sattar, Sobia Hidayatullah, Natasha Tyler, Sehrish Tofique, Ameer Bukhsh, Ozlem Eylem-van Bergeijk, and Alexander Hodkinson contributed equally to methodology. Tayyaba Kiran, Maria Panagioti, Sehrish Irshad, Rabia Sattar, Sobia Hidayatullah, Natasha Tyler, Sehrish Tofique, Ameer Bukhsh, Ozlem Eylem-van Bergeijk, Büşra Özen-Dursun, Nusrat Husain, Nasim Chaudhry, and Alexander Hodkinson contributed equally to writing—review and editing. Tayyaba Kiran, Maria Panagioti, Sehrish Irshad, Rabia Sattar, Sobia Hidayatullah, Natasha Tyler, Sehrish Tofique, Ameer Bukhsh, Ozlem Eylem-van Bergeijk, and Büşra Özen-Dursun contributed equally to formal analysis.

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focus on offering universal mental health/suicide awareness training programs and/or selective treatments to reduce STBs and improve suicide prevention competencies in educational settings.

Public Health Significance Statement

These findings are novel and very relevant to public health policy because they provide guidance on designing the framework and content of effective suicide prevention strategies at educational settings. Universal mental health/suicide awareness training programs could be best seen as first-line preventative strategies for youth suicidal thoughts and behaviors (STBs) at educational settings. More intensive psychotherapeutic programs might be best fitted for treating young people with several risks or previous experiences of STBs. Gatekeeper training programs improve suicide prevention and help-seeking skills among young people, their peers, and guardians/teachers. Although some of our key findings are in line with the findings of large, high-quality trials in the field, most of the included studies were of low quality, therefore, our conclusions might not apply universally, especially in settings where large, high-quality trials have not been conducted yet such as low- and middle-income countries.

Keywords: young people, suicide prevention, schools and educational settings, network meta-analysis

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Suicide rates surpass 800,000 people each year worldwide (World Health Organisation [WHO], 2021), meaning that almost one individual dies by suicide every 40 s. Suicide is the second leading cause of death for children and young people under the age of 25 years. Death by suicide can be prevented and considerable expedited efforts should be made to avert it. Suicide attempts are the strongest predictor of suicide among suicidal thoughts and behaviors (hereafter referred to as STBs; WHO, 2021). STBs are at their peak in adolescence (Longobardi et al., 2020). Therefore, identifying effective suicide prevention programs for young people under 25 is a high policy priority globally. Commissioning effective interventions to prevent or reduce STBs at educational settings such as schools, colleges, and universities could be a crucial component of nationwide youth suicide prevention programs. Key advantages of interventions based at educational settings is that they can reach many young people, including subgroups of young people who may be at high risk for suicide but opt not to access help due to health inequalities or service or cultural barriers (Asarnow & Miranda, 2014; Wasserman et al., 2015).

The main types of suicide prevention strategies evaluated in educational settings include those targeting the entire population (i.e., universal), individuals at high risk (i.e., selective), or individuals already experiencing suicidal behaviors (i.e., indicated). Regarding content, suicide prevention strategies at educational settings focus on education and/or awareness of mental health and suicide, gatekeeper suicide prevention training that involves the identification and referral of the at-risk individuals, or more rarely psychotherapeutic treatments. To date, several reviews and meta-analyses have examined the effectiveness of interventions to prevent or reduce STBs in children and young people (Brann et al., 2021; Gijzen et al., 2022; Harrod et al., 2014; Pistone et al., 2019). Some of these reviews have included any types of controlled or uncontrolled study designs which evaluated interventions to prevent or reduce STBs in young people across varied healthcare, community, and educational settings. This broad inclusive approach has produced informative comprehensive overviews of the published literature on youth suicide prevention and has provided useful future research directions. Some others have focused on educational settings. However, they have not used network meta-analyses, which are able to make direct and indirect comparisons among the different

interventions to examine which intervention types/contents work best for preventing youth STBs and improving youth suicide prevention competencies in educational settings.

This systematic review with network meta-analysis aims to examine the comparative effectiveness of controlled interventions to prevent or reduce STBs and improve competencies for preventing STBs in young people in educational settings. STBs are strongly linked with symptoms of depression, anxiety, and feelings of hopelessness (Lew et al., 2019). Therefore, we also examined the effectiveness of these controlled interventions in reducing them. We focused our network meta-analyses on comparing the effectiveness of major types of interventions (universal; selective; and indicated) and common intervention contents (education and awareness of suicide training; gatekeeper prevention training; health care professional screening and psychotherapeutic strategies; Institute of Medicine Committee, 2002).

Method

This meta-analysis conformed with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Network Meta-Analysis (PRISMA-NMA; Hutton et al., 2015) and the Cochrane Handbook for Systematic Reviews (Higgins et al., 2019). It was registered with PROSPERO (registration CRD42020208723).

Eligibility Criteria

We included studies which fulfill all of the six criteria:

1. Involved children and young people aged between 12 and 25 years from any sociodemographic background or staff members in educational settings working with young people aged between 12 and 25 years.
2. Evaluated interventions based at educational settings (schools, colleges, and universities) such as universal interventions (i.e., targeting the entire population of young people or staff members at educational settings), selective interventions (i.e., targeting young people at high risk or educational or health care staff members at educational settings dealing with young people at risk) and indicated

interventions (i.e., targeting young people already exhibiting high risk for suicide). Key intervention contents included education and/or awareness of suicide risk in young people, gatekeeper suicide prevention training of educational staff that involves the identification and referral of the at-risk young people (Cross et al., 2011), improved screening of young people for suicide risk by health care professionals, and psychotherapies.

3. Contained comparator groups such as no treatment, waiting list control, minimal intervention such as information provision and referral to community services (e.g., healthcare centers), usual care (UC), or fully active interventions.
4. Reported primary outcome data on STBs (e.g., suicide attempts, suicidal behaviors, or suicidal ideation) at postintervention or suicide prevention competencies (suicide-related knowledge, help-seeking skills, and attitudes) at postintervention. Other secondary outcomes included depression, anxiety, and hopelessness.
5. Employed controlled intervention research designs including randomized controlled trials (RCTs), cluster RCTs, crossover trials, controlled before–after studies, and quasi-experimental study designs.
6. Were based at schools, colleges, and universities of any country.

We excluded studies that were not written in English and were not published in peer-reviewed journals.

Study Identification and Selection

Three international databases, including the Cochrane Central Register of Controlled Trials (CENTRAL), Medline (the U.S. National Library of Medicine's database), and the PsycInfo (the behavioral science and mental health database), were searched from inception until April 2021. No language or country restrictions were applied. The reference lists of all included studies and previous systematic reviews were screened for additional studies. ClinicalTrials.gov and OpenTrials.net were also searched for any unpublished or ongoing trials. The search strategy included a combination of Mesh terms and keywords which were identified via previous systematic reviews, scanning the background literature, and by discussions within our team (see the [online supplemental materials](#), p. 2 for full search strategy). Two authors (Tayyaba Kiran and Maria Panagioti) screened the titles and abstracts and assessed the full texts of the eligible studies based on key prespecified eligibility criteria. Interrater reliability for both title/abstract and text screening was high ($k = 0.95$). Disagreements were resolved through discussion.

Data Extraction and Management

A modified version of the Cochrane Public Health Group's data extraction form was used independently by two reviewers to carry out the data extractions. First, 10 randomly selected studies were pilot-tested by two reviewers (Tayyaba Kiran and Maria Panagioti), who performed any amendments accordingly. Data were extracted on: (a) *study characteristics*: first author and date, country and setting (e.g., school, college, university); (b) *participant characteristics*: age and gender; (c) *intervention*: complexity, content, length, delivery method, delivery staff; (d) *control group*: UC, waiting list, other; and

(e) *outcomes*: STBs, suicide prevention competencies. Disagreements in the data extraction were resolved through discussions.

Assessment of Risk of Bias

The quality of the individual studies was assessed independently by one reviewer (Ioannis Angelakis) using the Cochrane risk of bias tool 2.0 (Higgins & Savović, 2019) for RCTs and the ROBINS-I (Sterne et al., 2016) for observational intervention studies and checked by a second reviewer (Alexander Hodkinson).

Data Analysis

First, we conducted separate network meta-analyses on the intervention *type* and *content* (Dias et al., 2014). For the suicide thoughts and behaviors, which were mostly dichotomous, we converted all data to the log odds ratio (OR) for purpose of the analysis, and then these were converted back to the OR in the final presented results. All pooled OR for STBs were reversed for ease of interpretation in the results. For the continuous outcomes; suicide prevention competencies, depression, anxiety, and hopelessness, we converted data to the standardized mean difference (SMD) and interpreted pooled effect sizes according to Cohen's criteria (Durlak, 2009). All transformations of raw data were done using the Comprehensive Meta-Analysis statistical package (Version 3; Borenstein, 2005). For studies reporting more than one mode of STBs the most severe mode was included in the analysis (i.e., suicide attempts followed by suicidal behaviors followed by suicidal thoughts), and for studies reporting more than one mode of suicide prevention competencies we included help-seeking skills first followed by attitudes and knowledge.

The network for intervention type included the following five intervention groups (universal, selective, indicated, active control, and no treatment/UC) and intervention content (education and awareness, gatekeeper, psychotherapy/other [e.g., counseling], active control, no treatment/UC). We analyzed the primary outcomes (suicidal behavior and suicide prevention competency) through a random-effects network meta-analysis model using the package *netmeta* in R Version 4.0.5 (R Foundation for Statistical Computing). Network graphs scaled by the number of studies and forest plots presented by each treatment node compared with no treatment or UC were presented in figures. League tables of all head-to-head comparisons of treatments were also inspected. We considered the I^2 statistic and the (heterogeneity) variance in the random effect's distribution (τ^2) to measure the extent of the influence of variability across and within studies on treatment effects. Traditionally, values of 25%, 50%, and 75% indicate low, moderate, or high heterogeneity. The P -score, a frequentist analog to the Surface Under the Cumulative RAnking curve (Salanti et al., 2011), was used to rank the treatment performance. P -scores with higher percentages represent the best intervention option. Consistency was evaluated by separating direct from indirect evidence with the use of node splitting (Higgins et al., 2012). To calculate consistency throughout the entire network, Cochrane's Q statistic was used (Krahn et al., 2013). To examine the presence of bias due to small-study effect, a network funnel plot was used to visually scrutinize the criterion of symmetry. A sensitivity analysis involved the network of only the RCTs with non-RCTs removed.

Second, we conducted a series of univariate network meta-regressions for the two main outcomes (suicidality and competencies) to explore the impact of possible moderator variables. We fitted all

regression models in OpenBUGS (Version 3.2.3; Lunn et al., 2009) using uninformative prior distributions for the treatment effects and a minimally informative prior distribution for common heterogeneity standard deviation. We assumed uninformative priors for all meta-regression coefficients. We ensured model convergence by visual inspection of three Markov Chain Monte Carlo chains after considering the Brooks–Gelman–Rubin diagnostic and autocorrelation plots. Overall, five variables were examined including the study sample size (0 = up to 200 patients; 1 = between 200 and 500; 2 = over 501), country of study (0 = the United States; 1 = Europe; 2 = Australia; 4 = other), study setting (0 = school; 1 = university/college), sample type (0 = pupils/students; 1 = educational staff). A sensitivity analysis on the quality of the studies involved using the overall RoB scores for each RCT (classified as high RoB for scores ≤ 3 , and low RoB for scores > 3), and the overall RoB scores for the observational studies using ROBINS-I (classified as high RoB if either “serious” or “critical” risk, and low RoB if “low” or “moderate” risk). This allowed for combining of the RCT and observational studies in a sensitivity analysis.

Finally, we conducted pairwise meta-analyses for the secondary outcomes, including anxiety, depression, and hopelessness using DerSimonian Laird random-effects (DerSimonian & Laird, 1986). The pooled effect sizes were assessed using the *meta set/meta forestplot* commands in Stata, Version 16 (StataCorp L., 2019). Heterogeneity was quantified using I^2 (Higgins et al., 2003), and publication bias was assessed for meta-analysis involving more than 10 studies by producing funnel plots using the *meta funneplot* command, and Egger’s tests (Egger et al., 1997) using the *meta bias, egger* command in Stata. In case of significant publication bias, the Duval and Tweedie’s trim-and-fill method was applied (Duval & Tweedie, 2000) using the *meta trimfill* as a sensitivity analysis.

Results

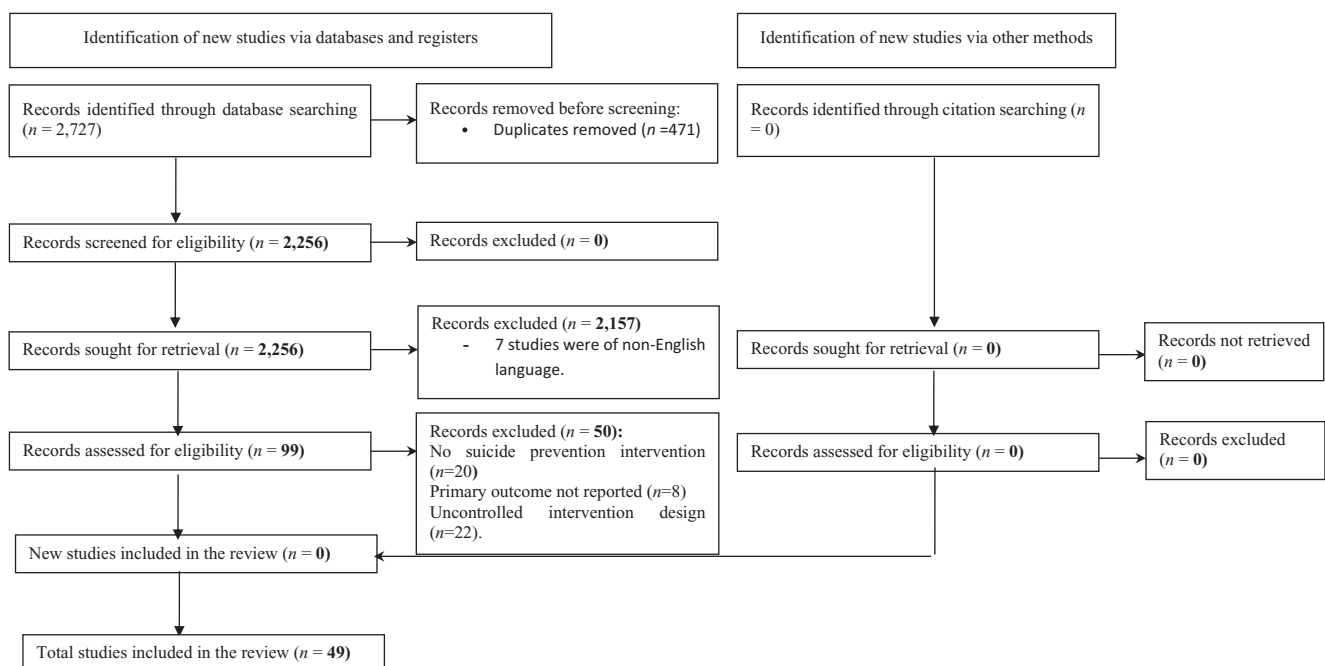
Overall, we identified 2,727 citations. After excluding 471 duplicates, and another 2,157 studies that did not meet the eligibility criteria for inclusion, we were left with 99 studies for full-text screening. Of these, 50 studies were excluded because their intervention description did not refer to/target STBs or suicide prevention competencies and they did not measure any of these outcomes. Eight further studies were excluded because although they did refer broadly to STBs or suicide prevention competencies in the intervention description, they did not include a measure of STBs/suicide prevention competencies. Finally, 22 studies were excluded because they did not use controlled intervention designs. This systematic review and meta-analysis involved a total of 49 studies comprising 42,039 participants (Figure 1). Citations of the included studies are presented in the online supplemental materials (pp. 3–5).

Descriptive Characteristics of the Included Studies

As described in the online supplemental materials (pp. 6–13), 71% ($k = 35$) of the studies were conducted in the United States, 12% ($k = 6$) in Australia, 6% ($k = 3$) in Europe, 4% ($k = 2$) in Taiwan, 4% ($k = 2$) in Israel, and 2% ($k = 1$) in Canada.

Most of the interventions targeted pupils or students ($k = 36$; 74%), educational staff ($k = 11$; 22%), or healthcare staff ($k = 2$; 4%). Thirty-five (71%) of these studies took place in school settings, with the remaining 29% ($k = 14$) of studies being conducted in universities or colleges. With regard to the type of interventions used, 55% ($k = 27$) were universal targeting the entire classroom and staff, 31% ($k = 15$) were selective targeting only a small

Figure 1
PRISMA Flow Diagram for the Entire Review



Note. PRISMA = Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

group of young people, and 14% ($k = 7$) were indicated focusing on young people at risk. Most of the included studies were RCTs ($k = 37$; 76%), 25% ($k = 12$) used any other quasi-experimental design (e.g., pre-post only or nonrandomized experimental designs), and the majority used no treatment or a waiting list control group (92%; $k = 45$), with only 8% ($k = 4$) which used an active control as a comparator. Seventeen (35%) studies had a small sample size comprising of up to 200 participants, 33% ($k = 16$) had a moderate sample size (ranging between 201 and 500 participants), and 33% ($k = 16$) had a large (over 501 participants) sample size.

Assessment of Risk of Bias

The methodological appraisal of the studies demonstrated that the majority of the RCT studies ($k = 29$; 80.5%) showed high risk of bias, with seven studies (19.5%) to be identified as low risk of bias. The remaining 13 non-RCT studies all had a high risk of bias. Both risk of bias results are presented in the [online supplemental materials](#) (pp. 14–16).

Network Meta-Analysis

Four network meta-analysis models were performed to assess the effectiveness of *type* and *content* of interventions to reduce suicidal behaviors and increase competencies in dealing with suicidal behaviors.

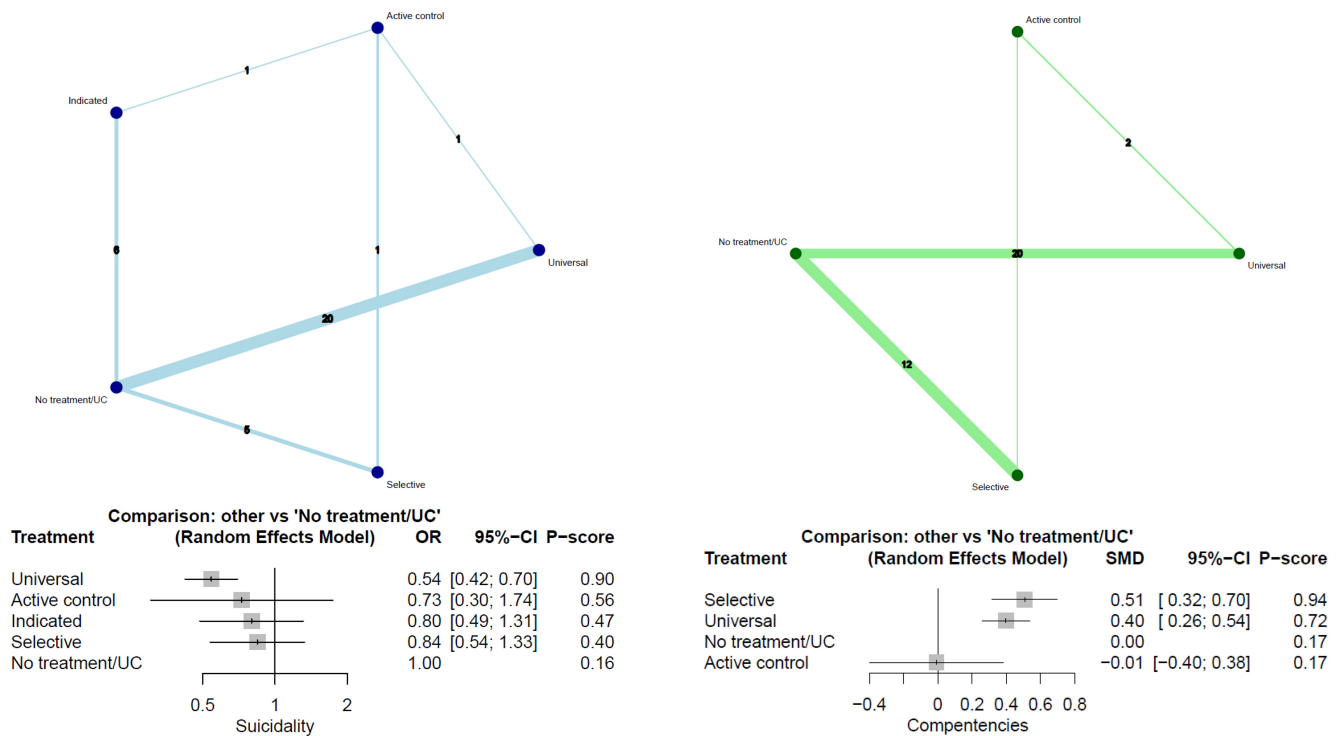
Type of Intervention

The network meta-analysis involving 34 comparisons and focusing on the type of interventions delivered, showed that only *universal* interventions were significantly associated with two-fold reductions in the odds of STBs compared to no-treatment groups (OR [reversed] = 1.85, 95% confidence interval [CI] [1.43–2.38]) ([Figure 2](#), left). This was also the only significant association in the head-to-head comparisons (see the [online supplemental materials](#), pp. 17–18). The P -score supported these findings and showed that *universal* interventions (90%) were more effective in reducing odds for engagement in STBs. Global heterogeneity of the network was large, $I^2 = 72$ (60–80)%, and the network of direct/indirect evidence was consistent (see inconsistency analysis results in the [online supplemental materials](#), pp. 19–21). There was evidence of publication bias through Egger's test ($p = .001$; see the [online supplemental materials](#), pp. 22–25).

In 35 comparisons, selective (SMD = 0.51, 95% CI [0.32–0.70]) and universal interventions (SMD = 0.40, [0.26–0.54]) were moderately effective in increasing suicide prevention competencies when compared to no-treatment groups ([Figure 2](#), right). The P -scores suggest that selective interventions (94%) were more effective than universal (72%) at increasing competencies. The league table of the head-to-head comparisons of the interventions showed a more significant effect for increasing suicide prevention competencies for both selective (SMD = 0.51, 95% CI [0.32–0.70]) and universal interventions (SMD = 0.40, [0.26–0.54]) when compared to active control. Global heterogeneity of the network was very high, $I^2 =$

Figure 2

Network and Forest Plot for Suicidality and Competencies Based on Intervention Type (Left: Suicidality; Right: Suicide Prevention Competencies)



Note. UC = usual care; SMD = standardized mean difference; CI = confidence interval. See the online article for the color version of this figure.

92 (90–94)%, but no inconsistencies were found. There was evidence of publication bias ($p < .0001$).

Content of Intervention

The network meta-analysis which was based on 34 comparisons and examined the content of the interventions demonstrated that only education/awareness programs (OR [reversed] = 1.59, 95% CI [1.23–2.02]) and psychotherapy programs (OR [reversed] = 2.04, [1.25–3.33]) were associated with 1.5- and two-fold reductions in the odds of STBs compared to nontreatment, respectively (Figure 3, left). These were also the only significant associations in the head-to-head comparisons. The P -score suggested that *psychotherapy* (85%) was more effective than the *education/awareness* modules of suicide (60%) in reducing odds of STBs. Global heterogeneity of the network was high $I^2 = 72$ (60–80)%, inconsistency was not present in the network, and there was evidence of publication bias ($p = .010$).

In 35 comparisons, gatekeeper universal interventions ($SMD = 1.04$, 95% CI [0.73–1.34]), gatekeeper selective interventions ($SMD = 0.52$, [0.26–0.77]), and *education/awareness* interventions ($SMD = 0.28$, [0.12–0.44]) were strongly to weakly significantly more effective in increasing suicide prevention competencies when compared to no-treatment groups (Figure 3, right). The P -scores showed that gatekeeper universal (100%) was more effective than gatekeeper selective (77%) in increasing competencies. Global heterogeneity of the network was high, $I^2 = 93$ (91–94)%, and inconsistency of the network was not of concern. There was

evidence of publication bias ($p = .0002$). The head-to-head results showed that gatekeeper universal interventions were significantly more effective than every other active intervention (see the [online supplemental materials](#), pp. 17–19).

Sensitivity Analysis

Sensitivity analysis removing the three non-RCTs for STBs did not alter the significance in any of the findings for both the type and content of interventions (see the [online supplemental materials](#), pp. 26–27). Removing the 10 non-RCTs for suicide prevention competencies led to similar results, with the exception being the gatekeeper universal intervention in the content network findings, where the effect size was increased ($SMD = 1.40$, 95% CI [0.99–1.80]).

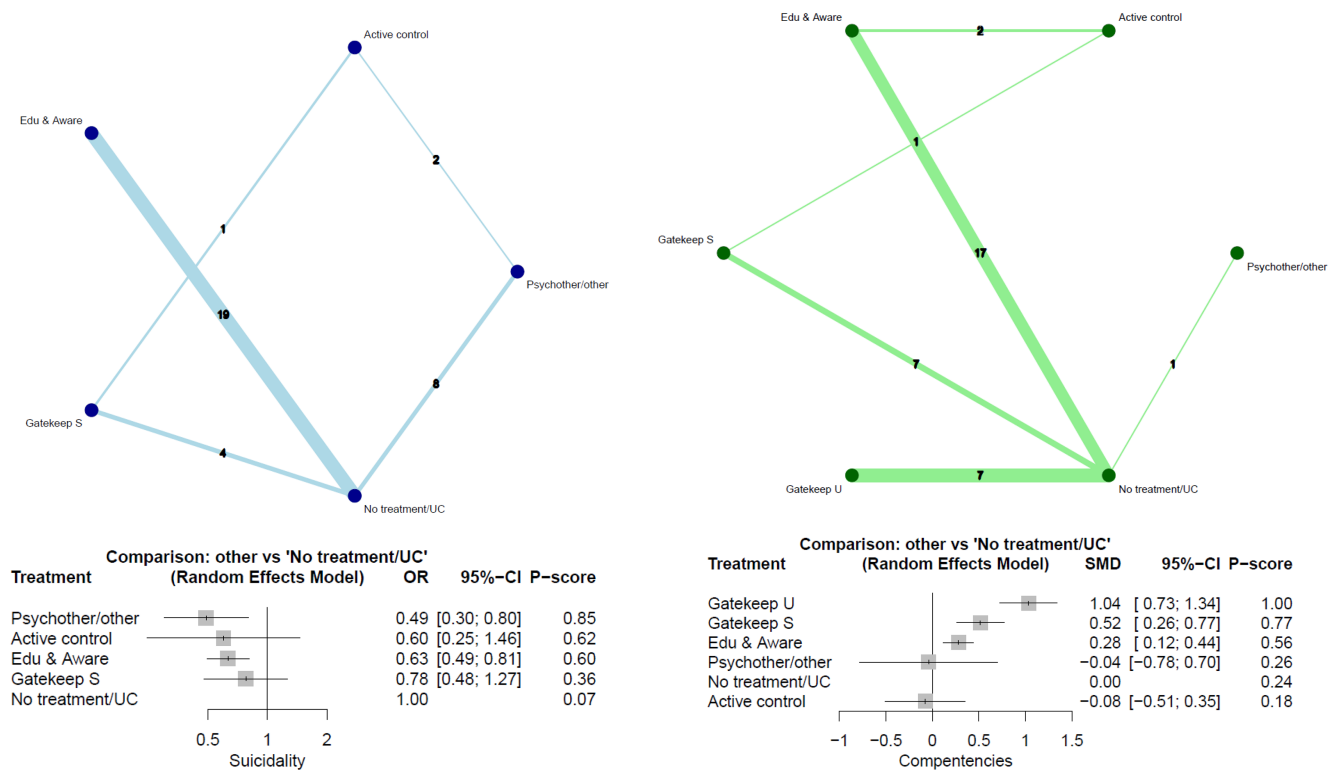
Another sensitivity analysis based only on studies which provided data on suicide attempts did not alter the significance of the main findings for both the type and content of interventions, except that psychotherapies were nonsignificant in reducing suicide attempts ($OR = 0.97$, 95% CI [0.52–1.81]).

Meta-Regressions

We found that universal interventions aiming at reducing STBs were more effective when targeted at pupils/students ($\beta = -0.21$, 95% CI [−3.97 to −0.04], $p = .037$) than educational staff, and that higher risk studies contributed larger effect sizes for the universal ($\beta = -0.32$, [−0.67 to −0.06], $p = .022$) and the indicated interventions

Figure 3

Network and Forest Plot for Suicidality and Competencies Based on Intervention Content (Left: Suicidality; Right: Suicide Prevention Competencies)



Note. UC = usual care; SMD = standardized mean difference; CI = confidence interval. See the online article for the color version of this figure.

($\beta = -0.73$, $[-0.97$ to $-0.23]$, $p = .009$; see the [online supplemental materials](#), pp. 28–30). We also found that school students receiving universal interventions significantly showed better suicide prevention competencies when compared to those of college/university students ($\beta = -0.521$, 95% CI $[-0.986$ to $-0.057]$, $p = .028$) and that higher risk studies contributed larger effect sizes for the universal interventions ($\beta = 0.467$, $[0.043$ – $0.873]$, $p = .037$). Indicated interventions aiming at increasing suicide prevention competencies were more effective when focused on pupils/students than educational staff ($\beta = 0.597$, 95% CI $[0.031$ – $0.873]$, $p = .042$).

Pairwise Analyses of Primary and Secondary Outcomes

All interventions (independent of type/content) pooled together were associated with significant reductions in suicidal ideation (*OR* [reversed] = 1.61, 95% CI $[1.37$ – $1.75]$), suicide attempts (*OR* [reversed] = 1.45, $[1.15$ – $1.85]$) and suicidal behaviors (*OR* [reversed] = 1.47, $[1.04$ – $2.08]$) compared to control groups. Furthermore, those interventions targeting help-seeking skills (*SMD* = 0.48, 95% CI $[0.13$ – $0.75]$) and attitudes toward suicide/STB (*SMD* = 0.38, $[0.22$ – $0.63]$) demonstrated small to moderate improvements. However, all other interventions pooled together were nonsignificant in improving suicide prevention knowledge, depression, anxiety, and hopelessness compared to control groups (see results in the [online supplemental materials](#), pp. 36–43).

Discussion

This systematic review with network meta-analysis found that universal interventions that targeted the entire classroom or group of participants significantly reduced the odds of STBs in young people by up to almost two-fold compared to those receiving no treatment/UC. Participants in both universal and selective interventions reported significantly more effective suicide prevention/help-seeking competencies compared to participants who received no treatment/UC. With regard to intervention content, we found that education/awareness training for suicide and psychotherapy-based programs (which were typically more intensive programs targeting young people at risk) significantly reduced the odds of STBs in young people by two-fold when compared to no treatment controls. Participants in both education/awareness training of suicide and gatekeeper programs (particularly gatekeeper universal) reported significantly more effective suicide prevention/help-seeking competencies compared to no treatment.

The most common themes of education/awareness training programs for suicide prevention were to enhance mental health awareness, especially for depression and suicide, modify perceptions of depression and suicide, increase knowledge of suicide prevention resources, and improve intentions to engage in help-seeking behaviors. These programs encouraged young people directly to think and openly discuss with their peer group a range of issues related to mental health and suicide. Opportunities such as active participation are important because people who experience STBs have difficulties in verbalizing their feelings. Thus, prevention of STBs is perhaps more likely to be achieved if pupils are personally engaged in the intervention, than with adult-driven interventions, may not always reach the pupils at risk. We recommend the use of complementary evidence synthesis methods, such as realist synthesis, a theory-driven approach that could identify the underlying mechanisms of action

of different suicide prevention programs at schools by integrating a wide range of evidence including qualitative data from linked process evaluations (Rycroft-Malone et al., 2012). Our findings are broadly consistent with previous systematic reviews, which have found that interventions based in educational settings are effective at reducing STBs in young people and at improving youth suicide prevention competencies (Brann et al., 2021; Harrod et al., 2014; Pistone et al., 2019). For example, one systematic review and meta-analysis found that only education/awareness training programs for suicide were effective for reducing STBs in young people and for improving youth suicide prevention competencies (Pistone et al., 2019). Another recent systematic review found that postprimary school suicide prevention strategies were associated with 34% reduction in suicide attempts and 13% reduction in suicidal ideation among young people, which is consistent with our findings especially since we used a combined outcome of STBs (E. H. Walsh et al., 2022). However, that systematic review did not compare the effectiveness of different types/contents of interventions on STBs or suicide prevention competencies. The SEYLE trial (Wasserman et al., 2015), the largest trial in this field involving 168 schools and 11,110 pupils, also found that the Youth Aware of Mental Health program (YAM; a universal education/awareness training for pupils) led to two times reduced odds for suicide attempts among pupils at 12-month postintervention compared to the control group, whereas the gatekeeper training program for school staff and the screening program for health professionals were not effective in reducing suicide attempts among pupils.

Our network meta-analysis confirms this existing evidence and provides clearer guidance for designing suicide prevention strategies at educational settings. Specifically, for reducing youth STBs, our findings support the use of universal education/awareness training for suicide/mental health programs or psychotherapies which are typically more intensive and target young people at risk. For improving suicide prevention competencies among young people or educational staff, universal gatekeeper programs appear to be the most promising option although gatekeeper selective and education/awareness training programs are also effective. Our meta-regressions also found preliminary evidence that pupils at schools respond better to interventions aiming to increase their suicide prevention competencies than their older college/university counterparts. It is possible that younger children may have limited knowledge about suicide and prevention skills compared to older adolescents; these programs therefore might be critical for boosting younger children's suicide prevention competency/help-seeking, but more research is needed to verify this hypothesis. Furthermore, universal interventions aiming at reducing suicide and indicated interventions targeting competencies were more effective when targeted at pupils/students than educational staff, suggesting that personally engaging young people at risk is needed to improve suicide prevention at educational settings.

There were a number of limitations, which warrant discussion. First, suicide is a complex phenomenon (C. G. Walsh et al., 2018), which led to heterogeneity in some analyses being high. To account for this complexity, we used random-effects models and conducted meta-regressions. Second, the quality of most of the studies was low indicating an urgent need for higher quality randomized controlled studies and observational designs. Third, we found evidence of publication bias in our network meta-analyses. This means that there are potentially unpublished studies reporting nonsignificant findings that have not been included in our analyses.

However, we searched for gray literature and trial registers for unpublished studies to ensure a high sensitivity in our search strategy. Fourth, there was some lack of direct evidence in the network meta-analysis performed. However, no inconsistency was found in any of the network models, so we have high confidence in the indirect evidence. Fifth, we included some nonrandomized studies (10 for competencies; three for suicide thoughts and behaviors) in the network analysis which may have introduced bias. However, our sensitivity analysis removing the nonrandomized studies did not lead to any significant changes in the results apart from gatekeeper universal programs being even more effective in the content network findings, the other findings remained consistent. More complex approaches involving bias adjustments by down-weighting the non-randomized information in the network might have improved estimation (Cameron et al., 2015; Schmitz et al., 2013). However, while these approaches offer promise, they are problematic and often challenging to implement. Sixth, all included studies were based in high-income countries, and therefore our findings might not be generalized in low- and middle-income countries. Seventh, studies very rarely provided data on more than one follow-up time points, so our analyses were based only on postintervention, or the shorter follow-up time point available. Eighth, in all of our network analyses there was some head-to-head evidence that was reliant upon using only the indirect evidence, which can often bring a level of skepticism among some methodologists (Song et al., 2009). However, as one study (Papakonstantinou et al., 2020) suggests most of the information in network meta-analysis comes from indirect evidence anyway, and the number of pathways involved and the subjectivity to it being of low bias will only reinforce the reliability. Thus, we urge some caution in those findings that rely upon only indirect evidence. Ninth, understanding the cost-effectiveness of the interventions would be necessary in terms of any radial policy changes. However, <10% of the studies provided cost data meaning no evidence-based judgments could be made concerning this. We encourage study designs to assess for cost-effectiveness in the future. We combined the various modes of STBs. Although this can be a limitation, we based this decision on the argument that suicide may exist on a continuum ranging from suicidal ideation, behaviors, and attempts to suicide (Mann et al., 1999) which is further supported by evidence showing that both suicidal ideation and suicide attempts are equally important targets of suicide prevention programs (Large et al., 2021). Many of the included trials were designed based on the continuum hypothesis and have reported combined measures of STBs (instead of separate measures of suicide attempts or ideation). We also performed a sensitivity analysis based only on suicide attempts, which did not show any significant differences in the effect size. However, more studies are needed in the network meta-analysis to examine separately the impact of these interventions on suicide attempts and suicidal ideation because there is increasing evidence which shows that only a small subgroup of people with suicidal ideation attempt suicide (Klonsky et al., 2021). Finally, although most of the interventions were delivered in person, a small number ($k = 5$) were delivered remotely. Finally, we did not plan to examine the impact of the delivery mode on the effectiveness of the included interventions and the small number of remotely delivered interventions ($k = 5$) preclude any valid post hoc analyses, but it is a fruitful avenue for future analyses especially since more remotely delivered interventions may be published in the aftermath of the COVID-19 pandemic.

There are a number of headline implications for clinicians and policy makers derived from this study. Universal mental health/suicide awareness training programs may be the most optimal strategies to prevent youth STBs and improve suicide prevention competencies at educational settings of high-income countries. These programs can be delivered at scale with relatively low resources and by trained nonmental health professionals. However, their benefits are relatively small; young people receiving these have two times lower odds for STBs compared to young people receiving no treatment. Hence, these programs could be best seen as first-line preventative strategies for youth STBs at education settings whereas more intensive psychotherapeutic programs might be best fitted for treating young people with several risks or previous experiences of suicidal behaviors. Additionally, we recommend some caution in treating this finding as definitive evidence because our study has been predominately based on low-quality evidence. Although gatekeeper training programs were not effective in reducing STBs among young people in educational settings, they might be promising for improving suicide prevention and help-seeking skills among young people, their peers, and guardians/teachers. It is also likely that the benefits of gatekeeper training programs for preventing youth STBs might manifest more gradually over time (but we currently lack long-term follow-up data to verify this) or complementary components are needed to address the psychological well-being of gatekeepers which affect the effectiveness of gatekeeper training programs.

This systematic review and network meta-analysis demonstrated that universal mental health/suicide awareness training programs were effective in reducing both youth STBs at educational settings and improving suicide prevention knowledge, and help-seeking skills among young people, their peers, and guardians/teachers. Universal and selective gatekeeper training programs were also effective for improving suicide prevention and help-seeking skills but did not reduce youth STBs.

References

- Asarnow, J. R., & Miranda, J. (2014). Improving care for depression and suicide risk in adolescents: Innovative strategies for bringing treatments to community settings. *Annual Review of Clinical Psychology*, 10(1), 275–303. <https://doi.org/10.1146/annurev-clinpsy-032813-153742>
- Borenstein, M. (2005). *Comprehensive meta-analysis software (beta-version)*. BioStat.
- Brann, K. L., Baker, D., Smith-Millman, M. K., Watt, S. J., & DiOrio, C. (2021). A meta-analysis of suicide prevention programs for school-aged youth. *Children and Youth Services Review*, 121, Article 105826. <https://doi.org/10.1016/j.childyouth.2020.105826>
- Cameron, C., Fireman, B., Hutton, B., Clifford, T., Coyle, D., Wells, G., Dormuth, C. R., Platt, R., & Toh, S. (2015). Network meta-analysis incorporating randomized controlled trials and non-randomized comparative cohort studies for assessing the safety and effectiveness of medical treatments: Challenges and opportunities. *Systematic Reviews*, 4(1), Article 147. <https://doi.org/10.1186/s13643-015-0133-0>
- Cross, W. F., Seaburn, D., Gibbs, D., Schmeelk-Cone, K., White, A. M., & Caine, E. D. (2011). Does practice make perfect? A randomized control trial of behavioral rehearsal on suicide prevention gatekeeper skills. *The Journal of Primary Prevention*, 32(3–4), 195–211. <https://doi.org/10.1007/s10935-011-0250-z>
- DerSimonian, R., & Laird, N. (1986). Meta-analysis in clinical trials. *Controlled Clinical Trials*, 7(3), 177–188. [https://doi.org/10.1016/0197-2456\(86\)90046-2](https://doi.org/10.1016/0197-2456(86)90046-2)

- Dias, S., Welton, N. J., Sutton, A. J., & Ades, A. (2014). *NICE DSU technical support document 2: A generalised linear modelling framework for pairwise and network meta-analysis of randomised controlled trials* [Internet]. National Institute for Health and Care Excellence (NICE). <https://doi.org/https://www.ncbi.nlm.nih.gov/books/NBK310366/>
- Durlak, J. A. (2009). How to select, calculate, and interpret effect sizes. *Journal of Pediatric Psychology*, 34(9), 917–928. <https://doi.org/10.1093/jpepsy/jsp004>
- Duval, S., & Tweedie, R. (2000). Trim and fill: A simple funnel-plot-based method of testing and adjusting for publication bias in meta-analysis. *Biometrics*, 56(2), 455–463. <https://doi.org/10.1111/j.0006-341X.2000.00455.x>
- Egger, M., Smith, G. D., Schneider, M., & Minder, C. (1997). Bias in meta-analysis detected by a simple, graphical test. *BMJ*, 315(7109), 629–634. <https://doi.org/10.1136/bmj.315.7109.629>
- Gijzen, M. W. M., Rasing, S. P. A., Creemers, D. H. M., Engels, R. C. M. E., & Smit, F. (2022). Effectiveness of school-based preventive programs in suicidal thoughts and behaviors: A meta-analysis. *Journal of Affective Disorders*, 298(Pt A), 408–420. <https://doi.org/10.1016/j.jad.2021.10.062>
- Harrod, C. S., Goss, C. W., Stallones, L., & DiGuseppi, C. (2014). Interventions for primary prevention of suicide in university and other post-secondary educational settings. *Cochrane Database: Systematic Reviews*, 10(10), Article CD009439. <https://doi.org/10.1002/14651858.CD009439.pub2>
- Higgins, J. P., Jackson, D., Barrett, J., Lu, G., Ades, A., & White, I. (2012). Consistency and inconsistency in network meta-analysis: Concepts and models for multi-arm studies. *Research Synthesis Methods*, 3(2), 98–110. <https://doi.org/10.1002/jrsm.1044>
- Higgins, J. P., & Savović, J. (2019). Chapter 8: Assessing risk of bias in a randomized trial. In J. P. T. Higgins, J. Thomas, J. Chandler, M. Cumpston, T. Li, M. J. Page, & V. A. Welch (Eds.), *Cochrane handbook for systematic reviews of interventions version 6.4*. Cochrane.
- Higgins, J. P., Thomas, J., Chandler, J., Cumpston, M., Li, T., Page, M. J., & Welch, V. A. (2019). *Cochrane handbook for systematic reviews of interventions*. John Wiley & Sons.
- Higgins, J. P., Thompson, S. G., Deeks, J. J., & Altman, D. G. (2003). Measuring inconsistency in meta-analyses. *BMJ*, 327(7414), 557–560. <https://doi.org/10.1136/bmj.327.7414.557>
- Hutton, B., Salanti, G., Caldwell, D. M., Chaimani, A., Schmid, C. H., Cameron, C., Ioannidis, J. P. A., Straus, S., Thorlund, K., Jansen, J. P., Mulrow, C., Catalá-López, F., Gøtzsche, P. C., Dickersin, K., Boutron, I., Altman, D. G., & Moher, D. (2015). The PRISMA extension statement for reporting of systematic reviews incorporating network meta-analyses of health care interventions: Checklist and explanations. *Annals of Internal Medicine*, 162(11), 777–784. <https://doi.org/10.7326/M14-2385>
- Institute of Medicine (US) Committee on Pathophysiology and Prevention of Adolescent and Adult Suicide, Goldsmith, S. K., Pellmar, T. C., Kleinman, A. M., & Bunney, W. E. (Eds.). (2002). *Reducing suicide: A national imperative*. National Academies Press.
- Klonsky, E. D., Dixon-Luinenburg, T., & May, A. M. (2021). The critical distinction between suicidal ideation and suicide attempts. *World Psychiatry*, 20(3), 439–441. <https://doi.org/10.1002/wps.20909>
- Krahn, U., Binder, H., & König, J. (2013). A graphical tool for locating inconsistency in network meta-analyses. *BMC Medical Research Methodology*, 13(1), Article 35. <https://doi.org/10.1186/1471-2288-13-35>
- Large, M., Corderoy, A., & McHugh, C. (2021). Is suicidal behaviour a stronger predictor of later suicide than suicidal ideation? A systematic review and meta-analysis. *Australian & New Zealand Journal of Psychiatry*, 55(3), 254–267. <https://doi.org/10.1177/0004867420931161>
- Lew, B., Huen, J., Yu, P., Yuan, L., Wang, D.-F., Ping, F., Abu, M. T., Lester, D., Jia, C.-X., & Marco, I. (2019). Associations between depression, anxiety, stress, hopelessness, subjective well-being, coping styles and suicide in Chinese university students. *PLoS One*, 14(7), Article e0217372. <https://doi.org/10.1371/journal.pone.0217372>
- Longobardi, C., Morese, R., & Fabris, M. A. (2020). COVID-19 emergency: Social distancing and social exclusion as risks for suicide ideation and attempts in adolescents. *Frontiers in Psychology*, 11, Article 551113. <https://doi.org/10.3389/fpsyg.2020.551113>
- Lunn, D., Spiegelhalter, D., Thomas, A., & Best, N. (2009). The BUGS project: Evolution, critique and future directions. *Statistics in Medicine*, 28(25), 3049–3067. <https://doi.org/10.1002/sim.3680>
- Mann, J. J., Watermaux, C., Haas, G. L., & Malone, K. M. (1999). Toward a clinical model of suicide behaviour in psychiatric patients. *American Journal of Psychiatry*, 156(2), 181–189. <https://doi.org/10.1176/ajp.156.2.181>
- Papakonstantinou, T., Nikolakopoulou, A., Egger, M., & Salanti, G. (2020). In network meta-analysis, most of the information comes from indirect evidence: Empirical study. *Journal of Clinical Epidemiology*, 124, 42–49. <https://doi.org/10.1016/j.jclinepi.2020.04.009>
- Pistone, I., Beckman, U., Eriksson, E., Lagerlöf, H., & Sager, M. (2019). The effects of educational interventions on suicide: A systematic review and meta-analysis. *International Journal of Social Psychiatry*, 65(5), 399–412. <https://doi.org/10.1177/0020764019852655>
- Rycroft-Malone, J., McCormack, B., Hutchinson, A. M., DeCorby, K., Bucknall, T. K., Kent, B., Schultz, A., Snelgrove-Clarke, E., Stetler, C. B., Titler, M., Wallin, L., & Wilson, V. (2012). Realist synthesis: Illustrating the method for implementation research. *Implementation Science*, 7(1), Article 33. <https://doi.org/10.1186/1748-5908-7-33>
- Salanti, G., Ades, A., & Ioannidis, J. P. (2011). Graphical methods and numerical summaries for presenting results from multiple-treatment meta-analysis: An overview and tutorial. *Journal of Clinical Epidemiology*, 64(2), 163–171. <https://doi.org/10.1016/j.jclinepi.2010.03.016>
- Schmitz, S., Adams, R., & Walsh, C. (2013). Incorporating data from various trial designs into a mixed treatment comparison model. *Statistics in Medicine*, 32(17), 2935–2949. <https://doi.org/10.1002/sim.5764>
- Song, F., Loke, Y. K., Walsh, T., Glenny, A. M., Eastwood, A. J., & Altman, D. G. (2009). Methodological problems in the use of indirect comparisons for evaluating healthcare interventions: Survey of published systematic reviews. *BMJ*, 338(1), Article b1147. <https://doi.org/10.1136/bmj.b1147>
- StataCorp L. (2019). *Stata Statistical Software. Release 16* [Software]. Stata Press. <https://doi.org/https://www.stata.com/>
- Sterne, J. A., Hernán, M. A., Reeves, B. C., Savović, J., Berkman, N. D., Viswanathan, M., Henry, D., Altman, D. G., Ansari, M. T., Boutron, I., Carpenter, J. R., Chan, A. W., Churchill, R., Deeks, J. J., Hróbjartsson, A., Kirkham, J., Jüni, P., Loke, Y. K., Pigott, T. D., ... Higgins, J. P. (2016). ROBINS-I: A tool for assessing risk of bias in non-randomised studies of interventions. *BMJ*, 352(7965), Article i4919. <https://doi.org/10.1136/bmj.i4919>
- Walsh, C. G., Ribeiro, J. D., & Franklin, J. C. (2018). Predicting suicide attempts in adolescents with longitudinal clinical data and machine learning. *Journal of Child Psychology Psychiatry*, 59(12), 1261–1270. <https://doi.org/10.1111/jcpp.12916>
- Walsh, E. H., McMahon, J., & Herring, M. P. (2022). Research review: The effect of school-based suicide prevention on suicidal ideation and suicide attempts and the role of intervention and contextual factors among adolescents: A meta-analysis and meta-regression. *Journal of Child Psychology and Psychiatry*, 63(8), 836–845. <https://doi.org/10.1111/jcpp.13598>
- Wasserman, D., Hoven, C. W., Wasserman, C., Wall, M., Eisenberg, R., Hadlaczky, G., Kelleher, I., Sarchiapone, M., Apter, A., Balazs, J., Bobes, J., Brunner, R., Corcoran, P., Cosman, D., Guillemin, F., Haring, C., Iosue, M., Kaess, M., Kahn, J.-P., ... Carli, V. (2015). School-based suicide prevention programmes: The SEYLE cluster-randomised, controlled trial. *The Lancet*, 385(9977), 1536–1544. [https://doi.org/10.1016/S0140-6736\(14\)61213-7](https://doi.org/10.1016/S0140-6736(14)61213-7)
- World Health Organisation (WHO). (2021). *Suicide worldwide in 2019: Global health estimates*.

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QUESTIONNAIRE

C12(26) Part 1 of 2

Controlled Interventions to Improve Suicide Prevention in Educational Settings: A Systematic Review and Network Meta-Analysis

INSTRUCTIONS

- Read through the article and answer the multiple-choice questions provided below.
- **Some questions may have more than one correct answer;** in which case you must mark **all** the correct answers.

Background

Question 1: Is it **TRUE** that a decrease in suicidal thoughts and behaviours (STBs) in young people is experienced globally?

- A: YES
- B: NO

Introduction

Question 2: **ALL** of the following statements are **TRUE**, **EXCEPT**:

- A: Suicide rates surpass 800,000 people each year worldwide
- B: Almost one individual dies through suicide every 40 seconds
- C: Suicide is the second leading cause of death for children and young people under the age of 25 years
- D: Death by suicide can not be prevented
- E: Considerable expedited efforts should be made to avert suicide

Question 3: STBs are at their peak in which life phase?

- A: Late primary school years
- B: Young adulthood
- C: Adolescence
- D: Middle to late adulthood

Question 4: Is it **TRUE** or **FALSE** that effective interventions to prevent or reduce STBs at educational settings can reach many young people, including subgroups at high risk for suicide, but that they are not accessing help due to health inequalities or service or cultural barriers?

- A: TRUE
- B: FALSE

Question 5: Which one of the following suicide prevention strategies at educational settings is rarely used?

- A: Focusing on education and/or awareness of mental health and suicide
- B: Gatekeeper suicide prevention training involving the identification and referral of at-risk individuals
- C: Psychotherapeutic treatments

Question 6: Which of the following are typical characteristics of network meta-analysis to prevent and reduce STBs in young people?

- A: Making informative, comprehensive overviews of the published literature on youth suicide prevention
- B: Making direct and indirect comparisons among the different interventions
- C: Examining which intervention types/contents work best for preventing youth STBs
- D: Improving youth suicide prevention competencies in educational settings

Question 7: Are STBs strongly linked to symptoms of depression, anxiety, and feelings of hopelessness?

- A: YES
- B: NO

Question 8: The network meta-analyses in this study focus on comparing the effectiveness of major types of interventions and common intervention content. Which one of the following is categorised as a major type?

- A: Education and awareness of suicide training
- B: Gatekeeper suicide prevention training
- C: Health care professional screening
- D: Psychotherapeutic strategies
- E: Universal, selective, and indicated interventions

Method

Question 9: Studies included in this research involved which of the following groups?

- A: Children and young people aged between 12 and 25 years from any sociodemographic background
- B: Staff members in educational settings working with children and young people aged between 12 and 25 years
- C: Adolescents aged between 18 and 30 from any sociodemographic background
- D: Staff members in educational settings working with children and young people aged between 18 and 30 years

Question 10: Evaluated interventions based at educational settings, such as schools, colleges and universities, were used. Targeting young people already exhibiting high risk for suicide was identified as which of the following?

- A: Universal interventions
- B: Selective interventions
- C: Indicated interventions

Question 11: Which of the following key interventions specifically involve the identification and referral of the at-risk young people?

- A: Education and/or awareness of suicide risk in young people
- B: Gatekeeper suicide prevention training of educational staff
- C: Improved screening of young people for suicide risk by health care professionals
- D: Psychotherapies

Results

Question 12: This systematic review and meta-analysis involved a total of studies comprising participants.

- A: 42 | 42,039
- B: 45 | 49,039
- C: 49 | 42,039
- D: 49 | 45,039
- E: 42 | 49,039

Question 13: In this systematic review, in which country was by far the highest percentage of studies conducted?

- A: Australia
- B: Canada
- C: Europe
- D: America
- E: Israel

Question 14: Most of the interventions targeted which of the following groups?

- A: Pupils
- B: Educational staff
- C: Healthcare staff

Question 15: Regarding the type of interventions used, what percentage focused on young people at risk?

- A: 55%
- B: 14%
- C: 31%
- D: 65%

THE END

QUESTIONNAIRE

C12(26) Part 2 of 2

Controlled Interventions to Improve Suicide Prevention in Educational Settings: A Systematic Review and Network Meta-Analysis

INSTRUCTIONS

- Read through the article and answer the multiple-choice questions provided below.
- Some questions may have more than one correct answer; in which case you must mark **all** the correct answers.

Discussion

Question 1: Fill in the gaps.

This systematic review with network meta-analysis found that that targeted the entire classroom or group of participants significantly the odds of STBs in young people by up to almost two-fold compared to those receiving no treatment/usual care (UC)

- A: Universal interventions | increased
- B: Selective interventions | decreased
- C: Indicated interventions | increased
- D: Universal interventions | decreased
- E: Selective interventions | increased

Question 2: With reference to intervention content, which of the following significantly reduced the risk of STBs in young people?

- A: Education/awareness training for suicide
- B: Psychotherapy-based programs
- C: No treatment

Question 3: Prevention of STBs is perhaps more likely to be achieved in which of the following scenarios?

- A: If pupils are personally engaged in the intervention
- B: When adult-driven interventions are used

Question 4: Fill in the gaps.

A recent systematic review found that post primary school suicide prevention strategies were associated with in suicide attempts and in suicidal ideation among young people.

- A: 13% increase | 34% increase
- B: 34% increase | 13% increase
- C: 34% reduction | 13% reduction
- D: 13% reduction | 34% reduction

Question 5: Which of the following were found ineffective in reducing suicide attempts among pupils by the SEYLE trial (Wasserman et al., 2015)?

- A: The Youth Aware of Mental Health program (YAM; a universal education/awareness training for pupils)
- B: The gatekeeper training program for school staff
- C: The screening program for health professionals

Question 6: Which of the following two were supported by the findings of this research specifically for reducing youth STBs?

- A: Universal education/awareness training for suicide/mental health programs
- B: The gatekeeper training program for school staff
- C: Psychotherapies, which are typically more intensive and target young people at risk

Question 7: According to the meta-regressions used in this study, preliminary evidence was found that which group responded better to interventions aiming to increase their suicide prevention competencies?

- A: Pupils at schools
- B: College/university students

Question 8: Which of the following programs were found to be most effective in treating young people with several risks or previous experiences of suicidal behaviours?

- A: Universal mental health/suicide awareness training programs
- B: Intensive psychotherapeutic programs

Question 9: This systematic review and network meta-analysis demonstrated that universal mental health/suicide awareness training programs were effective among young people, their peers, and guardians/teachers in which of the following areas?

- A: Reducing youth STBs in educational settings
- B: Improving suicide prevention knowledge
- C: Improving help-seeking skills

Question 10: For which of the following were universal and selective gatekeeper training programs effective?

- A:** Improving suicide prevention and help-seeking skills
- B:** Reducing youth STBs

THE END



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C12(26)

Controlled Interventions to Improve Suicide Prevention in Educational Settings:

A Systematic Review and Network Meta-Analysis

*Time spent on activity												hour		min									
PART 1												PART 2											
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1						9						1						6					
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How relevant was the content of this activity to your scope of practice?			
			
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