Journal of Consulting and Clinical Psychology

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Online First Publication, December 30, 2024. https://dx.doi.org/10.1037/ccp0000930

AMERICAN PSYCHOLOGICAL ASSOCIATION

Journal of Consulting and Clinical Psychology

ISSN: 0022-006X

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Objective: This overview aims to summarize systematic reviews with meta-analyses estimating the effects of school-based depression prevention interventions on depression outcomes. ***Method:*** We conducted electronic searches (Australian Education Index, Google Scholar, ProQuest Dissertations and Theses A&I, Pubmed, Social Science Premium Collection), hand-searched key journals, and conducted backward and forward citation chasing to identify eligible reviews. Two reviewers independently screened records, assessed full texts for eligibility, and collected data. We narratively summarized review findings and quantified the overlap of primary studies across systematic reviews using Corrected Covered Area. ***Results:*** We identified 29 eligible systematic reviews with 472 included primary studies overall (*Mdn* = 35, range = 4–137). Only 177 primary studies (37%) were included in more than one review (Corrected Covered Area = 6%). We rated all reviews as low (10%) or critically low (90%) quality on A MeaSurement Tool to Assess systematic Reviews–2, and most reviews (86%) at high risk of bias on Risk Of Bias In Systematic reviews. Reviews mostly suggest school-based depression prevention interventions may have modest average positive impacts on depression-related outcomes—both overall and for specific stages of prevention, school levels and student ages, and specific program manuals and intervention types. However, some reviews did not detect effects, and most reviews noted concerns about primary study quality, heterogeneity, and publication bias in this body of evidence. ***Conclusions:*** School-based depression prevention interventions may be beneficial on average, though existing reviews have important methodological limitations. A living systematic review conducted according to methodological best practice could provide timely, relevant, and rigorous evidence for educational decision making.

What is the public health significance of this article?

The study provides an overview of systematic reviews with meta-analyses on depression prevention programs delivered directly to students in primary and secondary school settings. Many (but not all) reviews suggest that school-based depression prevention programs may yield small yet meaningful reductions on average in depression symptoms among primary and secondary school students. However, existing systematic reviews and meta-analyses have important methodological limitations. Decision-makers should exercise caution in applying these findings to their contexts, and future evidence syntheses should address the methodological limitations of existing reviews.

Keywords: depression, meta-analysis, overview, prevention, school

Supplemental materials: https://doi.org/10.1037/ccp0000930.supp

Pim Cuijpers served as action editor.

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The study registration, study protocol and analysis plan, data, code, and materials for this overview can be found on the Open Science Framework at https://osf.io/c7nyz/. There are no other published, in press, or under review studies that come from the same data set. Sean Grant's spouse is a salaried employee of Eli Lilly and Company and owns stock. Sean Grant has accompanied his spouse on company-sponsored travel. All other authors have no further disclosures to report.

Core funding for the HEDCO Institute for Evidence-Based Educational Practice is provided by donor funds to the University of Oregon. Financial support for this study was provided by the Ballmer Institute for Children's Behavioral Health.

continued

Depression is one of the most common mental health challenges facing children and adolescents today. Prevalence rates of clinically elevated depression symptoms among youth in the United States are approximately 12.9% (Lu, 2019). In addition, findings from the National Survey of Children's Health documented the lifetime prevalence of clinical (diagnosed) depression at 4.4% of U.S. children and adolescents ages 3–17 (Bitsko et al., 2022). Prevalence of depression may increase throughout childhood and adolescence, as lifetime prevalence estimates for youth ages 12–17 are much higher—one estimate is 20.9% of U.S. adolescents having experienced clinical depression (Bitsko et al., 2022). Furthermore, elevated rates of depression and depression symptomology are observed in children and adolescents across the world, with a recent meta-analysis documenting that the global prevalence of clinically elevated depression for youth is 25.2% (Racine et al., 2021). Left unaddressed, depression exerts a host of negative outcomes for youth during childhood and adolescence—and extending into adulthood. These challenges include academic problems (Clayborne et al., 2019; Finning et al., 2019), alcohol and other drug use (Groenman et al., 2017), and family conflicts and relational challenges (Clayborne et al., 2019). Consequently, urgent calls have been made to prioritize the well-being and mental health of students in primary and secondary schools (Shim et al., 2022).

School-based intervention is a promising approach to prevent youth depression (National Research Council, 2009). Numerous types of school-based depression prevention interventions exist (Caldwell et al., 2021; Werner-Seidler et al., 2021), varying by level of prevention (e.g., universal, targeted), school level as a proxy for psychological developmental stage (e.g., elementary, middle, high school), and prevention approach (e.g., cognitive-behavioral, social support). There are also prominent manualized depression prevention programs for the school context, such as the Aussie Optimism Program (AOP; Roberts et al., 2018) and the Penn Resiliency Program (PRP; Bastounis et al., 2016). In addition, schools are one of the few settings dedicated to healthy youth development where nearly all children and adolescents can be reached, especially when interventions are delivered during school hours (Arora et al., 2019). The delivery of prevention services in the school setting importantly eliminates the many barriers that exist when families seek out mental health support, such as time, transportation, stigma around seeking mental health support, staffing shortages, and scheduling challenges (Werner-Seidler et al., 2021). That said, there are concerns about whether these interventions have any meaningful public health impact (Cuijpers, 2022) and their ability to cause iatrogenic harm (Foulkes & Stringaris, 2023).

Many systematic reviews and meta-analyses have assessed the effectiveness of school-based interventions designed to prevent depression (Ahlen et al., 2015; Caldwell et al., 2019; Dray et al., 2017; Feiss et al., 2019; Rasing et al., 2017; Stockings et al., 2016; Werner-Seidler et al., 2021). An overview (also known as a "metareview" or "umbrella review") describes the current body of systematic review evidence on a topic of interest by systematically and coherently identifying, collating, and synthesizing these systematic reviews into a single document (Aromataris et al., 2020; Gates et al., 2022; Pollock et al., 2022). Several overviews of reviews have been published recently on interventions to prevent depression and depression episodes (Bellón et al., 2015; Hoare et al., 2021; Hu et al., 2020; Salazar de Pablo et al., 2021). While useful contributions to the literature, these reviews take a broader scope than youth and school-based interventions, and several systematic reviews on depression prevention interventions for youth are missing from these overviews (Johnstone et al., 2018; Phillips & Mychailyszyn, 2022; Tejada-Gallardo et al., 2020; Werner-Seidler et al., 2021; Zhang et al., 2023), resulting in limitations for potential evidence users seeking information specific to school populations and settings. The aim of this article was to provide an overview of systematic reviews with meta-analyses on the effectiveness of depression prevention interventions delivered directly to students in primary and secondary school settings on depression outcomes at any timepoint. The goal of this overview of reviews on school-based prevention interventions was to support the decisions of education stakeholders related to the development of policies, practice guidelines, and professional preparation and continuing development programs focused on youth behavioral health. In addition, this overview is intended to provide useful information to those conducting systematic reviews on school-based depression prevention.

Method

Our methods and reporting are informed by the Preferred Reporting Items for Overviews of Reviews Statement (Gates et al., 2022), the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) extension for reporting literature searches in systematic reviews (Rethlefsen et al., 2021), Joanna Briggs Institute guidance on umbrella reviews (Aromataris et al., 2020), and Cochrane guidance on overviews of reviews (Pollock et al., 2022). The prospective registration, review protocol, materials, data, and code can be found on the Open Science Framework at https://osf.io/c7nyz/ (Grant et al., 2024).

Eligibility Criteria

We included systematic reviews with a meta-analysis examining the effects of school-based depression prevention interventions

Sean Grant played a lead role in conceptualization, investigation, methodology, project administration, supervision, validation, writing–original draft, and writing–review and editing and an equal role in data curation, formal analysis, and visualization. Maria Schweer-Collins played a supporting role in conceptualization, investigation, methodology, writing–original draft, and writing–review and editing. Elizabeth Day played a supporting role in conceptualization, investigation, methodology, validation, writing–original draft, and writing–review and editing. Shaina D. Trevino played a lead role in data curation and visualization and a supporting role in conceptualization, project administration, writing–original draft, and writing–review and editing. Katarzyna Steinka-Fry played a supporting role in investigation, methodology, writing–original draft, and writing–review and editing. Emily E. Tanner-Smith played a lead role in funding acquisition and resources and a supporting role in conceptualization, investigation, methodology, project administration, supervision, writing–original draft, and writing–review and editing.

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delivered directly to primary and secondary school students. We used the definition of a "systematic review" provided in the PRISMA for Protocols (PRISMA-P) 2015 reporting guideline: "a systematic review attempts to collate all relevant evidence that fits pre-specified eligibility criteria to answer a specific research question. It uses explicit, systematic methods to minimize bias in the identification, selection, synthesis, and summary of studies" (Moher et al., 2015, p. 3). We used this definition to identify reviews that have the potential to provide reliable findings for evidence-informed decision making. Based on this definition, our operational criteria for a systematic review were as follows: (a) clear objectives, (b) an explicit and reproducible methodology, (c) a systematic search strategy for attempting to identify all studies that meet the review eligibility criteria, (d) critical appraisal of the included studies, and (e) systematic synthesis of the characteristics and findings of the included studies. Due to limitations in resources and language proficiency, we excluded reviews published in a language other than English. Although gray literature was eligible, we excluded reviews currently undergoing peer review or published only in a summary format (e.g., only as a conference abstract or executive summary).

We included systematic reviews that reported the results of at least one meta-analysis for school-based depression prevention interventions on at least one depression outcome (e.g., depression diagnosis, depression symptoms) at any timepoint versus any comparator. We used National Research Council (2009) definitions for prevention; we excluded meta-analyses of school-based interventions that (a) were not designed for depression specifically (e.g., health promotion interventions that may measure depression as one of several outcomes for mental health and well-being), (b) were not delivered directly to students (e.g., interventions delivered to parents or teachers), or (c) involved screening, identifying, or treating students with depression (based on either a verified diagnosis or use of an established cutoff score for a validated measure of depression).

Information Sources

We searched for eligible systematic reviews published using the following electronic databases (with search platforms in parentheses): Pubmed (National Library of Medicine), ProQuest Dissertations and Theses A&I (ProQuest), and Social Science Premium Collection (ProQuest). The Social Science Premium Collection includes the Criminology Collection, Education Collection (which includes Education Resources Information Center, or "ERIC"), International Bibliography of the Social Sciences, Library and Information Science Collection, Linguistics Collection, Politics Collection, Social Science Database, and Sociology Collection. We also searched the Australian Education Index to include regional bibliographic databases. We used *citationchaser* (Haddaway et al., 2022) for backward citation chasing (references cited in eligible systematic reviews and the primary studies that they included) and forward citation chasing (references citing the primary studies included in eligible systematic reviews). We additionally searched two trial registries (World Health Organization International Clinical Trials Registry Platform, https://clinicaltrials.gov/) and Google Scholar. Finally, we used *Paperfetcher* (Pallath & Zhang, 2023) for handsearching of key journals: *Behaviour Research and Therapy*, *Frontiers in Psychology*, *Journal of Consulting and Clinical Psychology*, and *Journal of Youth and Adolescence*.

Search Strategy

Two authors with systematic review experience (E.E.T.S., K.S.F.) developed the search strategy. Another author with systematic review experience (S.G.) subsequently reviewed the strategy prior to execution using the Peer Review of Electronic Search Strategies (PRESS) Guideline (McGowan et al., 2016). This PRESS peer review led to including additional prevention terms in subject headings (primary prevention, selective prevention, indicated prevention), as well as adding "indicated" and "meta" to our free text search of titles and abstracts. As a result of the PRESS peer review, we also explored several subject headings and exploding broad subject headings that we ultimately did not include due to concerns of significantly increasing the number of false positives yielded by our search strategy. We used previous overviews identified in our preliminary scans of the literature to inform our search terms (Hoare et al., 2021; Hu et al., 2020; Levinson et al., 2019; Salazar de Pablo et al., 2021). To focus on literature published after the conceptualization of subsyndromal depression (Volz et al., 2023) and following Joanna Briggs Institute recommendations (Aromataris et al., 2020), we limited our search to publications from 1990 until the date of the most recent search (updated on June 17, 2024). Our search strategy did not involve the use of any published search filters (see online Supplemental Material 1).

Selection Process

We used DistillerSR (web-based systematic review software) to manage and track the flow of records through the selection process. One team member (S.D.T.) uploaded the citations into DistillerSR and searched for duplicates using the "Duplicate Detection" function. We then used standardized forms in DistillerSR for the citation screening. After training in the standardized forms (led by S.G.) and their pilot-testing in the software (led by S.D.T.), two reviewers (a combination of E.D., E.E.T.S., M.S.C., and S.G.) independently screened the title and abstract of each citation for potentially eligible systematic reviews. Reviewers were not blind to journal titles nor to study authors and their institutions. We retrieved the full text for each citation deemed potentially eligible by at least one reviewer. Two reviewers (a combination of E.D., E.E.T.S., M.S.C., and S.G.) then independently assessed each full text for eligibility. We included all systematic reviews deemed eligible by both reviewers. Reviewer pairs resolved any disagreements about full-text eligibility via discussion, conferring with a third reviewer as needed. We recorded reasons for excluding citations at the full-text stage (see online Supplemental Material 2). Rather than excluding overlapping systematic reviews (i.e., reviews that share the same studies underlying reported results), we empirically examined overlap of included primary studies in eligible reviews (see below).

Data Collection Process and Items

We used standardized forms in DistillerSR for the data collection process based on a data collection codebook, informed by Cochrane guidance (Pollock et al., 2022), with all variables for which data were sought. Variables included bibliographic information (authors, year published), information related to the review question (population, interventions, comparators, outcomes, and settings), methodological quality of the overall systematic review using A MeaSurement Tool to Assess systematic Reviews–2 (AMSTAR-2; Shea et al., 2017),

risk of bias of depression outcomes using Risk Of Bias In Systematic reviews (ROBIS; Whiting et al., 2016), and meta-analytic output for eligible results (when reported: effect estimates, precision, heterogeneity, assessments of risk and reporting bias, certainty in the body of evidence). While our initial interest was depression prevention interventions delivered during school hours, most systematic reviews did not provide explicit operationalizations for "depression prevention intervention" and "school-based." Consequently, we revised our protocol to include systematic reviews that claimed to provide a meta-analytic estimate for "depression prevention interventions" that were delivered on school grounds (during school hours or out-of-school time). We then extracted the meta-analytic result from each review most closely matching our operationalization of school-based depression prevention (i.e., interventions designed for depression specifically and directly delivered to students during school hours). After training in the data collection codebook (led by S.G.) and pilot-testing forms in DistillerSR (led by S.D.T.), two reviewers (a combination of S.G. and either E.D., E.E.T.S., or M.S.C.) independently collected data from eligible systematic reviews. Reviewer pairs resolved any disagreements about data collection via discussion, conferring with a third reviewer as needed. Two senior reviewers (S.G. and E.E.T.S.) discussed and decided on any additions, modifications, or clarifications to the codebook after the data collection process commenced.

Synthesis Methods

We narratively summarized descriptive information about eligible systematic reviews. We then examined the overlap in eligible systematic reviews of (a) all primary studies and (b) studies of a school-based depression prevention intervention directly delivered to primary and secondary school students during normal school hours. We quantified overlap using Corrected Covered Area (CCA) calculations (Bougioukas et al., 2023) and visualized overlap using a citation matrix and CCA pairwise tables (Pieper et al., 2014). We examined this overlap for all primary studies included in an eligible systematic review, as well as primary studies specifically focused on school-based depression prevention interventions delivered directly to primary and secondary school students during normal school hours. Finally, we summarized meta-analytic outputs and their indication (population, intervention, comparison, outcome) as they were presented in the included systematic reviews (including how included reviews categorized interventions). As the purpose of our overview is to present and describe the current body of systematic review evidence on school-based depression prevention interventions, we summarized the extracted results exactly as they were presented in all included systematic reviews regardless of overlap (Pollock et al., 2022). To explore nonstatistical ("clinical") heterogeneity, we structured these summaries narratively and in a tabular format that allows examining variation (or similarity) in results across their reported indications (e.g., levels of prevention).

Reporting Bias and Certainty of Evidence Assessments

As noted above, we collected information on reporting bias and certainty of evidence assessments conducted by systematic review authors on eligible meta-analytic outputs when reported. We did not conduct our own assessments of reporting bias and certainty of evidence; if such information is not presented below, it was not provided by included reviews.

Results

Our search yielded 18,083 citations (see Figure 1). After removing duplicates, we screened 14,561 records and retained 2,305 records (16.0%) for full-text eligibility assessment. Of the 2,305 full texts assessed, we identified 29 eligible systematic reviews with information reported across 37 records (1.6% of full texts assessed for eligibility; 0.2% of all citations identified in our search). Online Supplemental Material 3 contains a list of detailed information on the 29 included systematic reviews.

Characteristics of Included Systematic Reviews

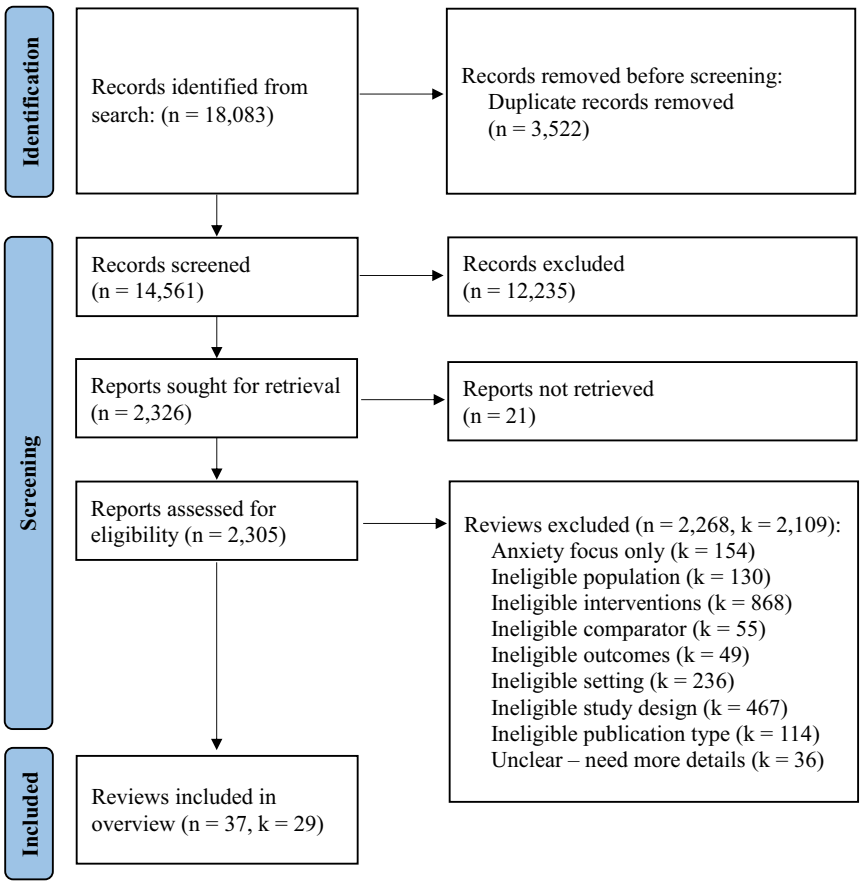
Twelve included systematic reviews specifically focused on school-based interventions for depression prevention (Bastounis et al., 2016; Caldwell et al., 2021; Cowen, 2014; Feiss et al., 2019; Gee et al., 2020; Johnstone et al., 2018; Kambara & Kira, 2021; Ma et al., 2020; Werner-Seidler et al., 2017, 2021; Zhang et al., 2023; Zheng et al., 2023). An additional seven reviews focused on youth depression prevention but did not have eligibility criteria requiring interventions to be school-based (Ahlen et al., 2015; Brunwasser et al., 2009; Brunwasser & Garber, 2016; Horowitz & Garber, 2006; Ssegonja et al., 2019; Stockings et al., 2016; Venning et al., 2009). The remaining 10 reviews had a wider primary focus than youth depression prevention but included a meta-analysis on school-based depression prevention interventions (Cuijpers et al., 2008; Davaasambuu et al., 2020; Dray et al., 2017; Duagi et al., 2024; Garber et al., 2016; Havlik, 2020; Kavanagh et al., 2009; Mychailyszyn, 2011; Reangsing et al., 2021; van Zoonen et al., 2014). The 29 reviews were published between 2006 and 2024, with a median publication year of 2017. These reviews most commonly searched APA PsycInfo (28 reviews; 96.6%), Pubmed (13 reviews; 44.8%), MEDLINE only (11 reviews; 37.9%), Cochrane Library (10 reviews; 34.5%), and Education Resources Information Center (nine reviews; 31.0%) to identify primary studies. The year that each review last conducted their literature search ranged from 2007 to 2023, with a median of 2018. Regarding research transparency, 23 reviews (79.3%) included a PRISMA flow diagram (Page et al., 2021), 10 reviews (34.5%) reported a registration number or cited a study protocol (Booth et al., 2012), and seven reviews (24.1%) provided statements about the availability of data, code, and/or materials underlying the review (Page et al., 2022).

Overlap of Primary Studies Across Systematic Reviews

The number of primary studies included in each review ranged from 4 to 137, with a median of 35 in each review and 472 unique primary studies included across all reviews. Of the 472 primary studies, only 177 studies (37.4%) were included in multiple reviews (see Figure 2)—likely because effect estimates of school-based depression prevention often came from subgroup analyses in reviews with a broad scope (e.g., depression treatment and prevention across settings). Of the 71 primary studies on school-based depression interventions, 48 studies (67.6%) were included in more than one review (see Figure 3). The CCA percentage for all primary studies

Figure 1

Flow Diagram for Identification of Systematic Reviews and Primary Studies



Note. n = references/citations; k = reviews. See the online article for the color version of this figure.

included across reviews (6.1%) was lower than the overall CCA percentage for primary studies on school-based depression interventions (18.0%). These numbers indicate only moderate overlap across reviews in all primary studies, though very high overlap across reviews in primary studies on school-based depression prevention delivered directly to students during school hours. That said, no single review identified all primary studies on school-based depression interventions—including recent reviews directly focused on school-based depression prevention (Caldwell et al., 2019; Werner-Seidler et al., 2021; Zhang et al., 2023), as opposed to reviews with a broader scope that included specific analyses on school-based depression prevention.

Methodological Quality and Risk of Bias of Included Systematic Reviews

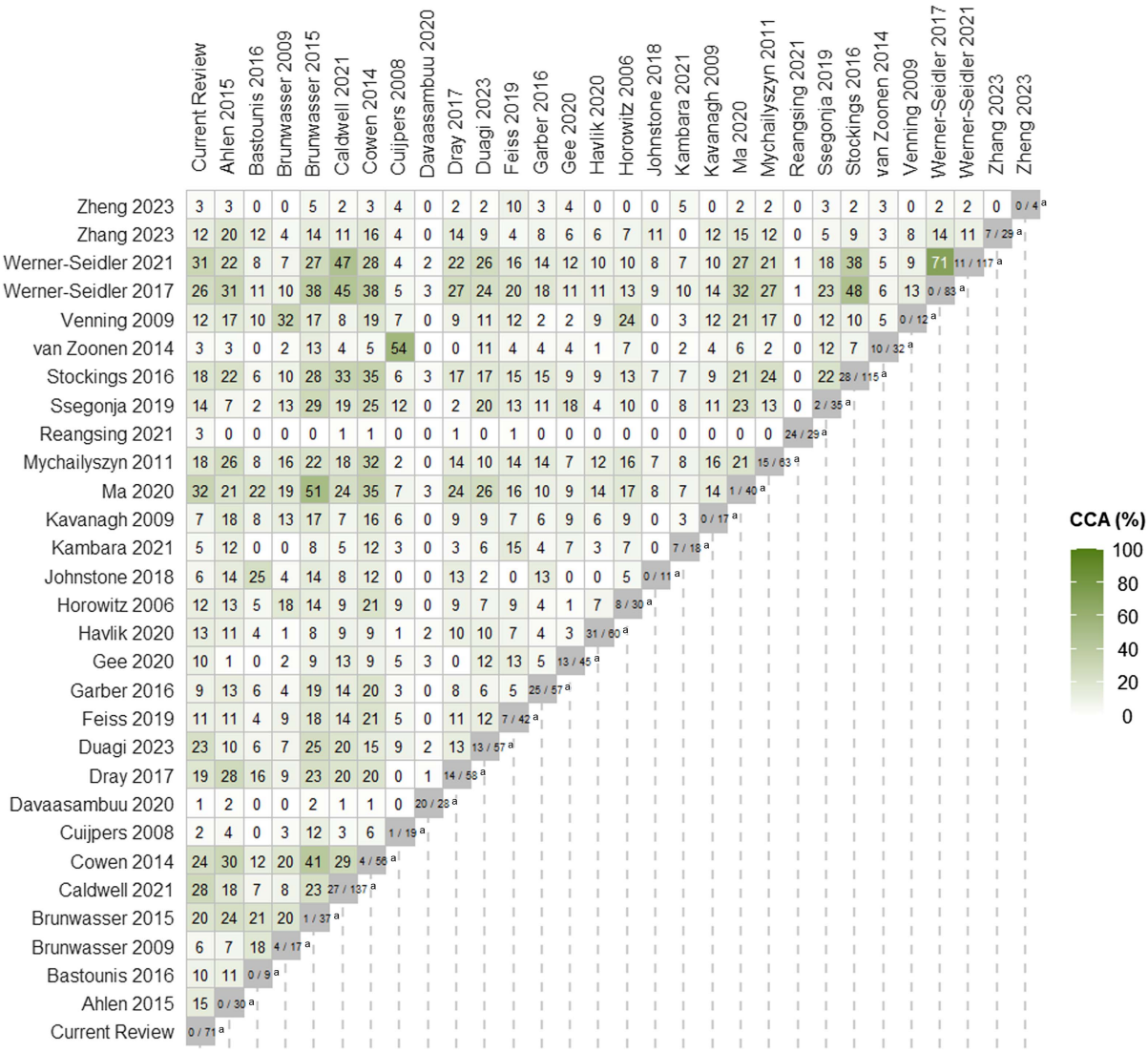
Online Supplemental Material 4 contains our critical appraisal assessments (i.e., ratings and rationale) for each item in both instruments across all included reviews. AMSTAR-2 assessments (see Table 1) yielded methodological quality ratings of low for three reviews (10%) and critically low for 26 reviews (89%). The critical weaknesses that resulted in lower quality ratings were lack of registering a protocol prior to conducting the review (20 reviews; 69%), an inadequate literature search process (18; 62%), inadequate assessment of risk of bias from individual studies being included in the review (16; 55%), inadequate assessment of presence and likely impact of publication bias (8; 28%), and inappropriate meta-analytical methods (7; 24%). ROBIS assessments (see Table 2) yielded ratings of low risk of bias for three reviews (10.3%), unclear risk of bias for one review (3.4%), and high risk of bias for 25 reviews (86.2%). The domain that most commonly resulted in ratings of high risk of bias was concerns about synthesis and findings (24 reviews; 82.8%), such as ignoring potential biases within and across studies, not accounting for important between-study variation, and potentially important inadequacies in the synthesis methodology.

Findings From Eligible Systematic Reviews

We identified effect estimates on depression outcomes for school-based depression prevention interventions overall (see Table 3), as well as for specific effect estimates by stage of prevention, school level, and type of intervention (see Table 4).

Figure 2

Overlap of All Primary Studies Across Systematic Reviews



Note. "Current Review" entails the 71 primary studies included across all 29 eligible systematic reviews that examined school-based depression prevention interventions delivered during normal school hours. CCA = Corrected Covered Area. See the online article for the color version of this figure.

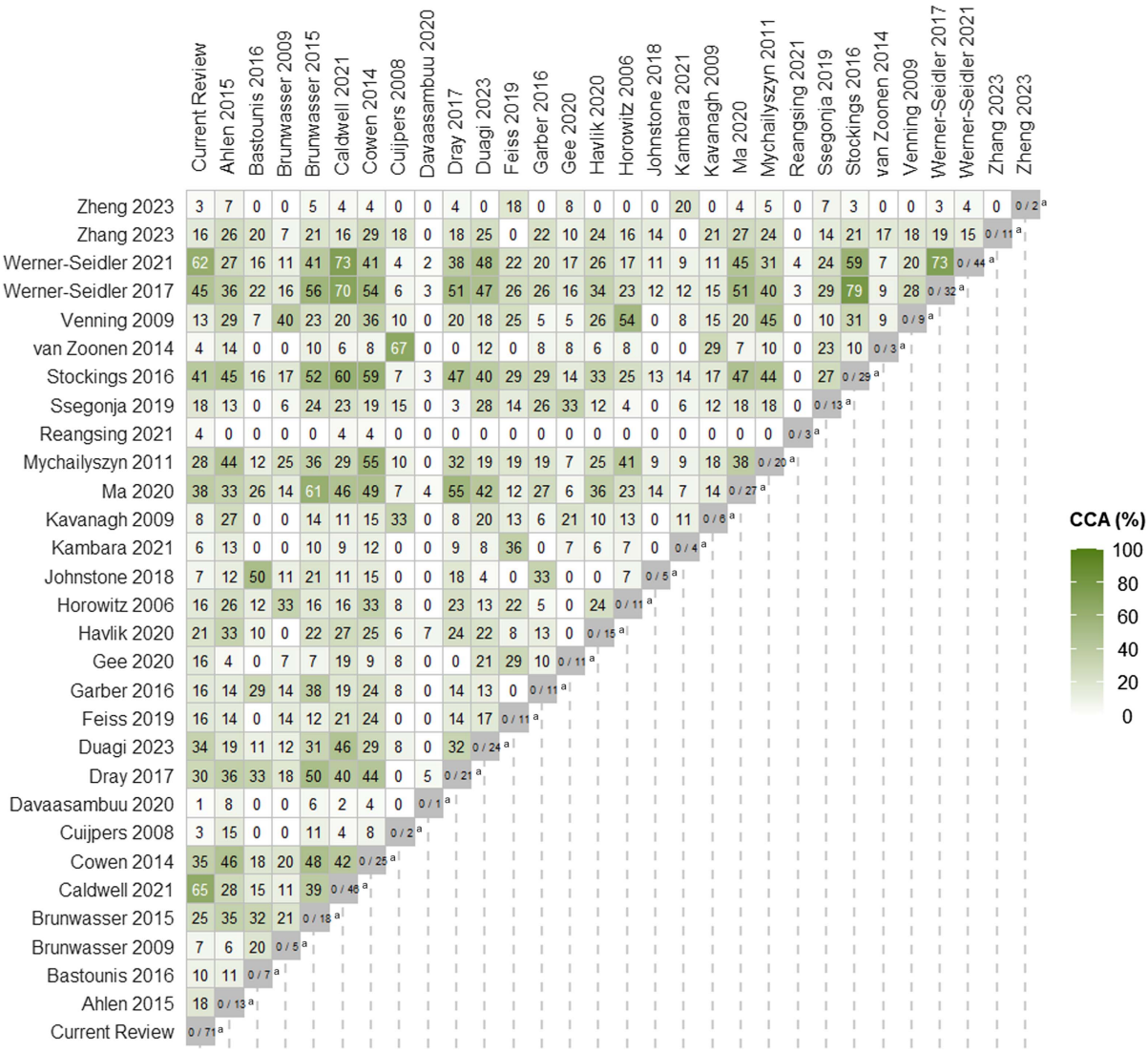
[a] Single/total number of primary studies included in the review.

Effect Estimates for School-Based Depression Prevention Interventions Overall

van Zoonen et al. (2014) reported lower incidence of depression disorders among students in school-based depression prevention interventions (vs. any comparator) across follow-up measurements ranging from 2 months to 5 years postintervention (incidence rate ratio = 0.81, 95% CI [0.68, 0.97]; number needed to treat = 21, 95% CI [12, 71]). Cuijpers et al. (2008) did not detect a statistically significant difference between prevention intervention and control groups on new cases of depressive disorders diagnosed using a diagnostic interview (rather than self-reported depression symptoms) at follow-up (incidence rate ratio = 0.83, 95% CI [0.61, 1.12]; risk difference = –0.021, 95% CI [–0.063, 0.021]; number needed to treat = 48). Werner-Seidler et al. (2021) found lower depression symptoms among students receiving school-based depression prevention programs (vs. no intervention, waitlist, or attention control) across all timepoints: postintervention (standardized mean difference [SMD] = 0.21, 95% CI [0.17, 0.24]), short-term follow-up (SMD = 0.17, 95% CI [0.13, 0.22]), medium-term follow-up (SMD = 0.10, 95% CI [0.06, 0.13]), and long-term follow-up (SMD = 0.10, 95% CI [0.05, 0.15]). However, Garber et al. (2016) did not detect a statistically significant difference between prevention interventions versus any comparator on depression symptoms (SMD = 0.14, 95% CI [–0.12, 0.39]). Zhang et al. (2023) did not detect a statistically significant difference between prevention interventions and any comparator on depression-related

Figure 3

Overlap of Primary Studies on School-Based Depression Prevention Interventions Delivered During Normal School Hours



Note. "Current Review" entails the 71 primary studies included across all 29 eligible systematic reviews that examined school-based depression prevention interventions delivered during normal school hours. CCA = Corrected Covered Area. See the online article for the color version of this figure.

[a] Single/total number of primary studies included in the review.

outcomes in their synthesis of studies that met methodological standards of the What Works Clearinghouse ($p = .723$). In contrast, Cowen (2014) reported positive impacts for students in depression prevention programs (vs. any comparator) in a meta-analysis combining all depression-related outcomes across all timepoints (SMD = 0.154, $p < .001$).

Effect Estimates for Specific Stages of Prevention

Universal Versus Targeted Interventions. Horowitz and Garber (2006) examined the relative effectiveness of universal, selective, and indicated prevention interventions for youth depression. They did not detect statistically significant differences at postintervention (universal SMD = 0.12, selective SMD = 0.29, indicated SMD = 0.18) but did detect statistically significant differences at follow-up (universal SMD = 0.02, selective SMD = 0.56, indicated SMD = 0.25).

Universal Interventions. Stockings et al. (2016) reported lower rates of depressive disorders among students receiving universal school-based depression prevention interventions (vs. no intervention, placebo, or usual care) at postintervention (risk ratio [RR] = 0.41, 95% CI [0.24, 0.69]), 1–3 months follow-up (RR = 0.35, 95% CI [0.24, 0.53]), and 6–9 months follow-up (RR = 0.45, 95% CI [0.35, 0.58]), though not at 12 months follow-up (RR = 0.86, 95% CI [0.59, 1.26]). In addition, Stockings et al. (2016) reported lower levels of depression symptoms postintervention (SMD = 0.11, 95% CI [0.05, 0.16]),1–3 months follow-up (SMD = 0.12, 95% CI [0.04, 0.21]), 6–9 months

Table 1
Methodological Quality of Included Systematic Reviews According to AMSTAR-2 Assessments

Review	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Overall
Ahlen et al. (2015)	N	N	Y	N	Y	Y	N	N	N	N	Y	N	N	Y	Y	Y	CL
Bastounis et al. (2016)	Y	Y	Y	PY	Y	Y	N	PY	Y	N	Y	N	N	Y	N	Y	CL
Brunwasser et al. (2009)	Y	N	Y	PY	Y	Y	N	PY	N	N	Y	N	N	Y	Y	N	CL
Brunwasser and Garber (2016)	Y	N	Y	N	N	N	N	Y	N	N	Y	N	N	N	N	Y	CL
Caldwell et al. (2021)	Y	Y	N	PY	Y	Y	N	PY	Y	N	Y	Y	Y	Y	Y	Y	L
Cowen (2014)	N	N	Y	PY	N	Y	N	N	N	N	Y	N	N	Y	N	N	CL
Cuijpers et al. (2008)	Y	N	N	N	N	N	N	PY	N	N	Y	N	N	Y	Y	Y	CL
Davaasambuu et al. (2020)	Y	N	N	PY	Y	Y	N	N	Y	N	Y	N	Y	N	Y	Y	CL
Dray et al. (2017)	Y	Y	N	N	Y	Y	N	PY	Y	N	Y	N	Y	Y	Y	Y	CL
Duagi et al. (2024)	Y	Y	N	PY	Y	Y	N	Y	Y	N	Y	N	Y	Y	Y	Y	L
Feiss et al. (2019)	Y	PY	Y	N	Y	Y	N	PY	Y	N	N	N	N	Y	Y	Y	CL
Garber et al. (2016)	Y	N	N	N	N	N	N	PY	N	N	Y	N	N	Y	Y	Y	CL
Gee et al. (2020)	Y	Y	N	PY	Y	Y	N	PY	PY	N	Y	Y	Y	Y	Y	Y	L
Havlik (2020)	Y	N	Y	N	N	Y	N	N	N	N	N	N	N	Y	Y	N	CL
Horowitz and Garber (2006)	Y	N	N	N	N	Y	N	N	N	N	N	N	N	Y	N	N	CL
Johnstone et al. (2018)	Y	N	N	N	Y	N	N	PY	N	N	Y	N	N	Y	Y	Y	CL
Kambara and Kira (2021)	Y	N	Y	N	Y	N	N	PY	Y	N	Y	N	Y	Y	Y	Y	CL
Kavanagh et al. (2009)	Y	N	N	Y	N	Y	Y	Y	N	N	Y	Y	Y	Y	N	Y	CL
Ma et al. (2020)	Y	N	N	N	N	Y	N	N	Y	N	Y	Y	Y	Y	Y	Y	CL
Mychailyszyn (2011)	N	N	Y	N	N	Y	N	N	N	N	N	N	N	Y	Y	N	CL
Reangsing et al. (2021)	Y	N	Y	Y	Y	Y	N	N	N	N	Y	Y	Y	Y	Y	Y	CL
Ssegonja et al. (2019)	Y	N	N	N	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	CL
Stockings et al. (2016)	Y	Y	N	N	N	Y	N	PY	Y	N	Y	Y	N	Y	N	Y	CL
van Zoonen et al. (2014)	Y	N	N	PY	N	Y	N	PY	PY	N	Y	Y	N	Y	Y	Y	CL
Venning et al. (2009)	Y	N	N	N	N	Y	Y	PY	N	N	N	N	N	N	N	N	CL
Werner-Seidler et al. (2017)	Y	Y	N	N	Y	Y	N	PY	N	N	Y	N	Y	Y	Y	Y	CL
Werner-Seidler et al. (2021)	Y	Y	N	N	Y	Y	N	PY	N	N	Y	Y	Y	Y	Y	Y	CL
Zhang et al. (2023)	Y	N	Y	N	Y	Y	Y	Y	PY	N	Y	N	N	Y	Y	Y	CL
Zheng et al. (2023)	Y	N	N	PY	Y	Y	N	PY	Y	N	N	N	N	N	N	Y	CL

Note. The column numbers refer to the 16 individual items in AMSTAR-2 and the overall AMSTAR-2 rating for methodological quality of the systematic review. N, L, and CL are shaded red. PY and Y are shaded green. AMSTAR-2 = A MeaSurement Tool to Assess systematic Reviews–2; N = no; Y = yes; CL = critically low; PY = partial yes; L = low. See the online article for the color version of this table.

follow-up (SMD = 0.19, 95% CI [0.11, 0.27]), and 12 months follow-up (SMD = 0.09, 95% CI [0.01, 0.17]), though not at 18 months follow-up (SMD = −0.01, 95% CI [−0.06, 0.04]). Ahlen et al. (2015) also reported lower depressive symptoms at postintervention (SMD = 0.14, $p = .01$) for students receiving universal school-based depression prevention interventions (vs. any comparator), though they did not detect a statistically significant difference at follow-up (SMD = 0.05, $p = .12$).

Targeted Interventions. Gee et al. (2020) reported lower depression symptoms among students receiving indicated, school-based depression prevention interventions (vs. any comparator) on depression symptoms at postintervention (SMD = 0.45, 95% CI [0.27, 0.63]) and up to 6 months follow-up (SMD = 0.19, 95% CI [0.04, 0.33]), though not at 6–12 months follow-up (SMD = 0.10, 95% CI [−0.14, 0.35]) and over 12 months follow-up (SMD = 0.10, 95% CI [−0.08, 0.28]).

Effect Estimates for Specific School Levels

Secondary School. Havlik (2020) found secondary school students receiving school-based depression prevention interventions (vs. treatment-as-usual comparison groups) to have lower depression symptoms at follow-up (SMD = 0.13, 95% CI [0.04, 0.22]).

Middle/High School. Feiss et al. (2019) reported greater reductions in depression symptoms among adolescents receiving school-based depression prevention interventions compared to control groups, $t(116) = -3.120$, $p < .01$.

Effect Estimates for Specific Intervention Approaches

Cognitive Behavioral Therapy. Mychailyszyn (2011) found students receiving cognitive-behavioral prevention interventions for depression to have greater reductions in depression symptoms than control groups (intervention pre–post SMD = 0.30, 95% CI [0.21, 0.40]; control pre–post SMD = 0.09, 95% CI [0.01, 0.16]; $Z = 3.56$, $p < .001$).

Cognitive Behavioral Therapy With Hopeful Elements. Venning et al. (2009) did not detect a statistically significant difference between school-based cognitive behavioral therapy (CBT) depression prevention that included hopeful elements versus control groups, no treatment, or usual care (weighted mean difference [WMD] = −0.21, 95% CI [−1.19, 0.77]).

Mindfulness Interventions. Reangsing et al. (2021) did not detect a statistically significant difference between mindfulness interventions versus any comparator without a mindfulness component on "depression outcomes" (SMD = 0.14, 95% CI [−0.02, 0.30]).

Resilience-Focused CBT. Ma et al. (2020) found lower depression symptoms among students receiving resilience-oriented cognitive-behavioral interventions versus nonactive comparators on depression symptoms at postintervention (SMD = 0.13, 95% CI [0.06, 0.19]), 6-month follow-up (SMD = 0.13, 95% CI [0.05,

Table 2
Risk of Bias in Included Systematic Reviews According to ROBIS Assessments

Review	Domain 1	Domain 2	Domain 3	Domain 4	Interpretation	Overall
Ahlen et al. (2015)	High	Low	High	High	No	High
Bastounis et al. (2016)	High	Low	Low	High	No	High
Brunwasser et al. (2009)	High	Low	High	High	No	High
Brunwasser and Garber (2016)	Unclear	High	High	High	No	High
Caldwell et al. (2021)	Low	Low	Low	Low	Yes	Low
Cowen (2014)	High	High	High	High	No	High
Cuijpers et al. (2008)	Unclear	Unclear	High	High	No	High
Davaasambuu et al. (2020)	High	High	High	High	Probably no	High
Dray et al. (2017)	Low	High	Low	High	No	High
Duagi et al. (2024)	High	High	Low	High	No	High
Feiss et al. (2019)	High	High	Low	High	No	High
Garber et al. (2016)	High	Unclear	High	High	No	High
Gee et al. (2020)	High	Low	High	Low	Yes	Low
Havlik (2020)	High	High	High	High	Probably no	High
Horowitz and Garber (2006)	Unclear	High	High	High	No	High
Johnstone et al. (2018)	High	High	High	High	No	High
Kambara and Kira (2021)	High	High	High	High	No	High
Kavanagh et al. (2009)	High	High	Low	High	No	High
Ma et al. (2020)	High	Unclear	High	Low	Probably no	High
Mychailyszyn (2011)	High	High	High	High	No	High
Reangsing et al. (2021)	High	High	High	Low	No	High
Ssegonja et al. (2019)	High	High	Low	High	No	High
Stockings et al. (2016)	High	Unclear	Low	High	No	High
van Zoonen et al. (2014)	High	Unclear	High	Low	No information	Unclear
Venning et al. (2009)	High	Unclear	High	High	No	High
Werner-Seidler et al. (2017)	High	High	High	High	No	High
Werner-Seidler et al. (2021)	High	High	High	High	No	High
Zhang et al. (2023)	High	Low	High	High	Probably yes	Low
Zheng et al. (2023)	Unclear	High	Low	High	No	High

Note. The columns refer to the four domains in ROBIS and the overall ROBIS rating for risk of bias in the reported effect estimate. "Low" and "Yes" are green, "Unclear" is yellow, "No information" is gray, and "High" and "No/Probably no" are red. ROBIS = Risk Of Bias In Systematic reviews. See the online article for the color version of this table.

0.22]), and 18-month follow-up (SMD = 0.07, 95% CI [0.01, 0.13]). They did not detect statistically significant differences at 12-month (SMD = 0.06, 95% CI [−0.01, 0.13]) and 24-month follow-up (SMD = 0.11, 95% CI [−0.01, 0.23]).

Effect Estimates for Specific Branded Programs

AOP. Brunwasser and Garber (2016) did detect statistically significant differences on depression symptoms between students receiving AOP or no-intervention control conditions at postintervention (SMD = 0.09, 95% CI [−0.01, 0.19]) and the first follow-up assessment of at least 6 months (SMD = 0.03, 95% CI [−0.08, 0.13]).

Interpersonal Psychotherapy–Adolescent Skills Training. Brunwasser and Garber (2016) found lower depression symptoms among students receiving Interpersonal Psychotherapy–Adolescent Skills Training (IPT-AST) versus no-intervention control conditions at postintervention (SMD = 0.49, 95% CI [0.28, 0.71]) and the first follow-up assessment of at least 6 months (SMD = 0.24, 95% CI [0.01, 0.46]).

LARS&LISA. Brunwasser and Garber (2016) did not detect statistically significant differences on depression symptoms between students receiving Lust An Realistischer Sicht & Leichtigkeit Im Sozialen Alltag versus no-intervention control conditions at postintervention (SMD = −0.01, 95% CI [−0.15, 0.13]) and the first follow-up assessment of at least 6 months (SMD = 0.10, 95% CI [−0.04, 0.25]).

PRP. Bastounis et al. (2016) did not detect a statistically significant at follow-up difference between PRP (or any of its derivatives) versus any comparator on depression symptoms as measured by the Children's Depression Inventory (WMD = 0.23, 95% CI [−1.09, 0.62]).

Problem Solving for Life. Brunwasser and Garber (2016) found lower depression symptoms among students receiving Problem Solving for Life versus no-intervention controls at postintervention (SMD = 0.19, 95% CI [0.11, 0.28]) but did not detect a statistically significant difference at the first follow-up assessment of at least 6 months (SMD = −0.03, 95% CI [−0.12, 0.06]).

Resourceful Adolescent Program. Brunwasser and Garber (2016) did not detect statistically significant differences on depression symptoms between students in Resourceful Adolescent Program versus no-intervention comparators at postintervention (SMD = 0.05, 95% CI [−0.15, 0.25]) and the first follow-up assessment of at least 6 months (SMD = −0.12, 95% CI [−0.25, 0.004]).

Effect Estimates for Stage of Prevention by School Level

Universal Prevention in Elementary/Middle School. Johnstone et al. (2018) found that students in elementary and middle school receiving universal school-based depression prevention programs (vs. waitlist, placebo, or usual care control conditions) had lower depression symptoms at postintervention (SMD = 0.17, 95% CI [0.06, 0.28]) and long-term follow-up (SMD = 0.18, 95% CI [0.01, 0.35]), though

Table 3
Meta-Analytic Effect Estimates for School-Based Depression Prevention Interventions Overall

Intervention	Comparator	Effect estimate	Heterogeneity	Study	Review
Depression diagnosis					
Depression prevention interventions	Control groups	2- to 60-month follow-up: IRR = 0.81 (0.68–0.97) NNT = 21 (12–71)	I^2 = 25%	14	van Zoonen et al. (2014)
		Follow-up measurements using standardized instruments only: IRR = 0.83 (0.61–1.12) RD = 0.02 (−0.02–0.06) NNT = 48	Q = 6.52 (p > .05) I^2 = 23%	6	Cuijpers et al. (2008)
Depression symptoms					
Depression prevention interventions	Any comparator	Postintervention: SMD = 0.21 (0.17–0.24)	I^2 = 47%	101	Werner-Seidler et al. (2021)
		Short-term follow-up (0–6 months): SMD = 0.17 (0.13–0.22)	NR	60	
		Medium-term follow-up (6–12 months): SMD = 0.10 (0.06–0.13)	NR	48	
		Long-term follow-up (over 12 months): SMD = 0.10 (0.05–0.15)	NR	20	
		Follow-up (undefined): SMD = 0.14 (−0.12–0.39)	NR	NR	Garber et al. (2016)
Depression outcomes (undefined)					
Depression prevention interventions	Any comparator	Follow-up (undefined): Marginal mean = 0.04 (p = .723)	NR	NR	Zhang et al. (2023)
		Follow-up (all timepoints combined): SMD = 0.154	Q = 148.16 (p < .01) I^2 = 47%	80	Cowen (2014)

Note. IRR < 1, marginal mean > 0, and SMD > 0 indicate effect estimates that favor the intervention group. Values in parentheses report information about statistical uncertainty (i.e., confidence intervals, credible intervals, and/or p values). IRR = incidence rate ratio; NNT = number needed to treat; RD = risk difference; SMD = standardized mean difference; NR = not reported.

Table 4
Effect Estimates for Depression Symptoms by Stage of Prevention, School Level, and Type of Intervention

Intervention	Comparator	Effect estimate	Heterogeneity	Study	Review
Stage of prevention					
Differential effects of universal, selective, and indicated	Control conditions	Universal versus selective prevention at postintervention: $\chi^2(1, 18) = 3.43$ ($p = .06$)	NR	NR	Horowitz and Garber (2006)
		Universal versus indicated prevention at postintervention: $\chi^2(1, 19) = 1.143$ ($p = .29$)	NR	NR	
		Universal versus targeted prevention up to 6-month follow-up: $\chi^2(2, 17) = 25.06$ ($p = .001$)	NR	NR	
		Selective versus indicated prevention up to 6-month follow-up: $\chi^2(1, 9) = 4.68$ ($p = .03$)	NR	NR	
Universal prevention	Any comparator	Postintervention: SMD = 0.11 (0.05–0.16)	NR	41	Stockings et al. (2016)
		1–3 months follow-up: SMD = 0.12 (0.04–0.21)	NR	9	
		6–9 months follow-up: SMD = 0.19 (0.11–0.27)	NR	27	
		12 months follow-up: SMD = 0.09 (0.01–0.17)	NR	17	
		18 months follow-up: SMD = −0.01 (−0.06 to 0.04)	NR	7	
		Postintervention: SMD = 0.14	NR	NR	Ahlen et al. (2015)
		Follow-up: SMD = 0.05	NR	NR	
Indicated prevention	Any comparator	Postintervention: SMD = 0.45 (0.27–0.63)	$\chi^2 = 162.41$ ($p < .001$) $I^2 = 81\%$ $\tau^2 = 0.21$	32	Gee et al. (2020)
		Up to 6 months follow-up: SMD = 0.19 (0.04–0.33)	$\chi^2 = 43.48$ ($p < .01$) $I^2 = 54\%$ $\tau^2 = 0.05$	22	
		6–12 months follow-up: SMD = 0.10 (−0.14 to 0.35)	$\chi^2 = 23.60$ ($p < .01$) $I^2 = 70\%$ $\tau^2 = 0.08$	8	
		Over 12 months follow-up: SMD = 0.10 (−0.08 to 0.28)	$\chi^2 = 0.06$ ($p > .05$) $I^2 = 0\%$ $\tau^2 = 0.00$	3	
School level					
Prevention at secondary school	Treatment-as-usual	Follow-up: SMD = 0.13 (0.04–0.22)	$Q = 358.47$ ($p < .001$) $I^2 = 80\%$	31	Havlik (2020)
Prevention at middle/high school	Any comparator	Follow-up: $t(116) = 3.120$ ($p < .01$)	Intervention $I^2 = 97\%$ Control $I^2 = 95\%$	NR	Feiss et al. (2019)
Intervention approach					
Cognitive-behavioral	Any comparator	Pre–post: $Z = 3.56$ ($p < .001$)	NR	NR	Mychailyszyn (2011)

(*table continues*)

Table 4 (*continued*)

Intervention	Comparator	Effect estimate	Heterogeneity	Study	Review
Resilience-focused CBT	Nonactive comparators	Postintervention: SMD = 0.13 (0.06–0.19)	I^2 = 79%	38	Ma et al. (2020)
		6-month follow-up: SMD = 0.13 (0.05–0.22)	I^2 = 76%	24	
		12-month follow-up: SMD = 0.06 (−0.01 to 0.13)	I^2 = 66%	16	
		18-month follow-up: SMD = 0.07 (0.01–0.13)	I^2 = 0%	9	
		24-month follow-up: SMD = 0.11 (−0.01 to 0.23)	I^2 = 79%	8	
CBT with hopeful elements	Control, no treatment, or usual care	12-month follow-up: WMD on BDI = −0.21 (−1.19 to 0.77)	NR	2	Venning et al. (2009)
Branded program					
Aussie Optimism Program	No-intervention control conditions	Postintervention: SMD = 0.09 (−0.01 to 0.19)	Q = 12.49 ($p < .05$)	3	Brunwasser and Garber (2016)
		Follow-up (first ≥6 months): SMD = 0.03 (−0.08 to 0.13)	Q = 3.88 ($p > .05$)	3	
Interpersonal Psychotherapy–Adolescent Skills Training	No-intervention control conditions	Postintervention: SMD = 0.49 (0.28–0.71)	Q = 11.38 ($p < .01$)	3	
		Follow-up (first ≥6 months): SMD = 0.24 (0.01–0.46)	Q = 9.12 ($p < .05$)	3	
Lust An Realistischer Sicht & Leichtigkeit Im Sozialen Alltag	No-intervention control conditions	Postintervention: SMD = −0.01 (−0.15 to 0.13)	Q = 4.29 ($p > .05$)	3	
		Follow-up (first ≥6 months): SMD = 0.10 (−0.04 to 0.25)	Q = 3.64 ($p > .05$)	3	
Penn Resiliency Program	Any comparator	Follow-up: WMD on Children's Depression Inventory = 0.23 (−0.62 to 1.09)	I^2 = 65% τ^2 = 0.86	9	Bastounis et al. (2016)
Problem Solving for Life	No-intervention control conditions	Postintervention: SMD = 0.19 (0.11–0.28)	Q = 4.07 ($p < .05$)	2	Brunwasser, and Garber (2016)
		Follow-up (first ≥6 months): SMD = −0.03 (−0.12 to 0.06)	Q = 0.01 ($p > .05$)	2	
Resourceful Adolescent Program	No-intervention control conditions	Postintervention: SMD = 0.05 (−0.15 to 0.25)	Q = 4.89 ($p < .05$)	2	
		Follow-up (first ≥6 months): SMD = −0.12 (−0.25 to 0.004)	Q = 3.42 ($p > .05$)	3	
Stage of prevention by school level					
Universal prevention in elementary/middle school	Waitlist, placebo, or usual care	Postintervention: SMD = 0.17 (0.06–0.28)	I^2 = 66%	10	Johnstone et al. (2018)
		Short-term follow-up (6–9 months): SMD = 0.16 (−0.01 to 0.33)	I^2 = 74%	6	
		Long-term follow-up (12 + months): SMD = 0.18 (0.01–0.352)	I^2 = 78%	7	

(*table continues*)

Table 4 (*continued*)

Intervention	Comparator	Effect estimate	Heterogeneity	Study	Review
Stage of prevention by intervention type					
Indicated preventive interventions involving group-based CBT	Any comparator	Postintervention: SMD = 0.22 (0.11–0.32)	NR	33	Ssegonja et al. (2019)
		6 months follow-up: SMD = 0.08 (0.00–0.15)	NR	21	
		6–12 months follow-up: SMD = 0.24 (0.08–0.41)	NR	17	
		Over 12 months follow-up: SMD = 0.14 (0.04–0.23)	NR	9	
Universal resilience-focused interventions	Controls	Follow-up: SMD = 0.08 (0.01–0.14) Grading of Recommendations Assessment, Development and Evaluation low certainty of evidence	$I^2 = 56\%$	30	Dray et al. (2017)
Penn Resiliency Program (as a universal program)	Any comparator	Postintervention: SMD = 0.06 (−0.10 to 0.23)	$Q = 8.00$ ($p = .16$) $I^2 = 38\%$	6	Brunwasser et al. (2009)
		6- to 8-month follow-up: SMD = 0.15 (−0.02 to 0.33)	$Q = 2.85$ ($p = .42$) $I^2 = 0\%$	4	
		12-month follow-up: SMD = 0.19 (0.01–0.37)	$Q = 0.69$ ($p = .88$) $I^2 = 0\%$	4	
School level by intervention type					
Teacher-delivered prevention in middle/high school	Any comparator	Follow-up: SMD = −0.07 (−0.61 to 0.47)	$\chi^2 = 26.91$ ($p > .05$) $I^2 = 93\%$ $\tau^2 = 0.42$	6	Davaasambuu et al. (2020)
CBT in upper secondary school	Any comparator	Postintervention: SMD = 0.34 (0.13–0.54)	$I^2 = 73\%$	16	Kambara and Kira (2021)
		Short-term follow-up: SMD = 0.68 (0.09–1.26)	$I^2 = 84\%$	6	
		Medium-term follow-up: SMD = 0.12 (−0.06 to 0.30)	$I^2 = 52\%$	8	
CBT in secondary school	Nonactive comparators	Up to 4 weeks postintervention: SMD = 0.15 (0.02–0.28)		11	Kavanagh et al. (2009)
Interpersonal Psychotherapy–Adolescent Skills Training in middle/high school	No-intervention control conditions	Postintervention: WMD on CES-D = 5.05 (1.98–8.11)	$\chi^2 = 21.41$ ($p < .001$) $I^2 = 77\%$ $\tau^2 = 10.37$	6	Zheng et al. (2023)
		6-month follow-up: WMD on CES-D = 3.09 (0.94–5.23)	$\chi^2 = 11.58$ ($p = .04$) $I^2 = 57\%$ $\tau^2 = 3.78$	6	
School level by stage of prevention by intervention type					
Universal CBT in primary school	Treatment as usual	Postintervention: SMD = 0.57 (−0.37 to 1.57)	$\tau = 0.34$ (0.03–0.96)	6	Caldwell et al. (2021)
Universal CBT in secondary school	No treatment	Postintervention: SMD = 0.14 (−0.06 to 0.36)	$\tau = 0.18$ (0.10–0.30)	18	
Targeted CBT in secondary school	Waitlist	Postintervention: SMD = 0.33 (−0.20 to 0.86)	$\tau = 0.38$ (0.24–0.62)	17	
Universal teacher-delivered prevention in middle/high school	No intervention or usual curriculum	12 months follow-up: SMD = 0.04 (−0.03 to 0.11)	$\chi^2 = 70.56$ ($p < .001$) $I^2 = 84\%$ $\tau^2 = 0.01$	12	Duagi et al. (2024)

Note. SMD > 0 indicates estimates that favor the intervention group. Values in parentheses report information about statistical uncertainty (i.e., confidence intervals, credible intervals, and/or *p* values). NR = not reported; SMD = standardized mean difference; CBT = cognitive behavioral therapy; WMD = weighted mean difference; BDI = Beck Depression Inventory; CES-D = Center for Epidemiological Studies–Depression.

they did not detect statistically significant differences at short-term follow-up (SMD = 0.16, 95% CI [−0.01, 0.33]).

Effect Estimates for Stage of Prevention by Intervention Type

Indicated Preventive Interventions Involving Group-Based CBT. Ssegonja et al. (2019) found both lower incidence of depression (postintervention RR = 0.43, 95% CI [0.21, 0.87]) and lower depression symptoms (postintervention SMD = 0.22, 95% CI [0.11, 0.32]) for indicated school-based depression prevention interventions involving group-based CBT versus any comparator at multiple follow-up points.

PRP (as a Universal Program). Brunwasser et al. (2009) reported several estimates favoring students receiving PRP (delivered as a universal school-based program) versus any comparator on depression symptoms, though they did not detect statistically significant differences at all timepoints (postintervention SMD = 0.06, 95% CI [−0.10, 0.23]; 6- to 8-month follow-up SMD = 0.15, 95% CI [−0.02, 0.33]; 12-month follow-up SMD = 0.19, 95% CI [0.01, 0.37]).

Universal Resilience-Focused Interventions. Dray et al. (2017) reported lower depression symptoms for students specifically receiving resilience-focused interventions delivered universally in schools (SMD = 0.08, 95% CI [0.01, 0.14]).

Effect Estimates for School Level by Intervention Type

Teacher-Delivered Prevention in Middle/High School. Davaasambuu et al. (2020) did not detect a statistically significant difference on depression symptoms at follow-up between adolescents in low- or middle-income countries receiving teacher-delivered depression prevention interventions or any comparator (SMD = −0.07, 95% CI [−0.61, 0.47]).

CBT in Upper Secondary School. Kambara and Kira (2021) reported lower depression symptoms for students in upper secondary school receiving CBT-based depression prevention interventions versus any comparator at postintervention (SMD = 0.34, 95% CI [0.13, 0.54]) and short-term follow-up (SMD = 0.68, 95% CI [0.09, 1.26]). They did not detect a statistically significant difference at medium-term follow-up (SMD = 0.12, 95% CI [−0.06, 0.30]).

CBT in Secondary School. Kavanagh et al. (2009) analyzed CBT-based depression prevention interventions delivered to students in secondary school *during the school day* (our a priori definition of "school-based" in this overview) and found lower depression symptoms (vs. any comparator) up to 4 weeks postintervention (SMD = 0.15, 95% CI [0.02, 0.28]).

IPT-AST in Middle/High School. Zheng et al. (2023) found lower depression symptoms among students receiving IPT-AST versus no-intervention control conditions when meta-analyzing data in the Center for Epidemiologic Studies–Depression Scale (postintervention WMD = 5.05, 95% CI [1.98, 8.11]; 6-month follow-up WMD = 3.09, 95% CI [0.94, 5.23]).

Effect Estimates for School Level by Stage of Prevention by Intervention Type

Caldwell et al. (2021) reported no strong evidence of differences on depression symptoms between students receiving universal CBT-based depression prevention versus usual curriculum at the primary school level (SMD = 0.57, 95% CrI [−0.37, 1.57]), universal CBT-based depression prevention versus no-intervention comparators at the secondary school level (SMD = 0.14, 95% CrI [−0.06, 0.36]), and targeted CBT-based depression prevention versus waiting list comparators at the secondary school level (SMD = 0.33, 95% CrI [−0.20, 0.86]). Duagi et al. (2024) did not detect a statistically significant difference on depression symptoms at 12-month follow-up between adolescents receiving universal teacher-delivered depression prevention interventions and adolescents either in a no-intervention control group or receiving usual curriculum (SMD = 0.04, 95% CI [−0.03, 0.11]).

Discussion

We identified 29 eligible systematic reviews that included 472 primary studies overall. Many reviews suggest that school-based depression prevention interventions overall (vs. any comparator) may have modest positive average impacts on depression-related outcomes (Cowen, 2014), including incidence of depression disorders (van Zoonen et al., 2014) and depression symptoms in larger and more recent meta-analyses (Werner-Seidler et al., 2017, 2021). However, other reviews did not detect statistically differences on depression-related outcomes between interventions and comparators when meta-analyzing studies meeting stricter methodological standards (Zhang et al., 2023), on depression symptoms in an older meta-analysis that focused on measures (Garber et al., 2016), and on incidence of depressive disorders measured through standardized interviews (Cuijpers et al., 2008) rather than both standardized interviews and other measures (e.g., cutoffs on self-report scales).

In addition, findings suggest several factors that may impact effectiveness, though future research is needed to improve confidence in these factors. For example, in terms of stages of prevention, both universal interventions (Ahlen et al., 2015; Stockings et al., 2016) and indicated interventions (Gee et al., 2020) may yield lower depression symptoms at postintervention, with resilience-focused interventions as potentially promising intervention type for universal prevention (Dray et al., 2017) and indicated interventions having the potential to have positive effects sustained at longer term follow-ups (Gee et al., 2020; Ssegonja et al., 2019). Some evidence suggests no detectable differences between levels of prevention at postintervention but higher effect sizes for targeted interventions at longer follow-ups (Horowitz & Garber, 2006). In terms of student age and school level, school-based depression prevention programs may reduce depressive symptoms for children at the primary school level (Johnstone et al., 2018) and adolescents at the secondary school level (Feiss et al., 2019; Havlik, 2020). However, analyses on teacher-delivered interventions delivered universally (Duagi et al., 2024) and in low- or middle-income countries (Davaasambuu et al., 2020) did not detect a statistically significant difference between intervention and control groups for adolescents in secondary school.

Findings also provide empirical support for specific program manuals and intervention approaches. For example, IPT-AST, PRP, and Problem Solving for Life may yield lower depression symptoms (Bastounis et al., 2016; Brunwasser et al., 2009; Brunwasser & Garber, 2016; Zheng et al., 2023), though not all estimates at all timepoints reached statistical significance. In contrast, all estimates for AOP, LARS&LISA, and Resourceful Adolescent Program did not detect statistically significant differences between manualized programs and comparator intervention groups (Brunwasser & Garber, 2016).

CBT-based depression prevention interventions may reduce depression symptoms for students (Mychailyszyn, 2011). Specific support for CBT-based prevention was found for students in secondary school when delivered during the school day (Kavanagh et al., 2009), for students in upper secondary school (Kambara & Kira, 2021), and when incorporating resilience-focused components (Ma et al., 2020). However, there was an absence of such evidence for CBT-based prevention at lower and upper secondary school combined as well as universally at the primary school level (Caldwell et al., 2021), school-based CBT prevention with hopeful elements (Venning et al., 2009), and school-based mindfulness interventions (Reangsing et al., 2021).

Implications for Policy and Practice

This overview aims to collate the type of evidence that is often the main criterion considered in evidence-informed decision making: that is, how substantial the anticipated desirable effects are on the primary outcome of interest and our certainty in these effects (Moberg et al., 2018). Many (but not all) meta-analyses offer evidence that school-based depression prevention interventions may have small beneficial effects that may be meaningful-at-scale overall. When reported, meta-analyses often indicated substantial heterogeneity—somewhat alleviated by reviews providing direct evidence for some school levels, stages of prevention, and types of intervention. However, we rated most reviews as conducted with critically low quality according to AMSTAR-2 and most meta-analytic estimates as having high overall risk of bias according to ROBIS. In addition, review authors generally noted concerns about primary study quality, heterogeneity, and publication bias in this body of evidence. These concerns are important to consider when using evidence to inform specific decisions around program adoption, implementation, funding, or policy mandates (i.e., instrumental or mandated uses of research evidence) or how decision-makers should think generally about investing in school-based mental health (i.e., conceptual use of research evidence; Tseng, 2012). Given concerns about review and study quality, our findings may be better suited for conceptual uses, rather than instrumental or mandated use. In other words, these findings are useful for broadly supporting consideration of school-based depression prevention initiatives but fall short of providing rigorous evidence to support policies mandating use of these interventions.

For those who assist educational practitioners and policymakers interested in using evidence to inform their decision making, we recommend turning to the reviews with higher quality and lower risk of bias to find more detailed information regarding programs and their effects (Caldwell et al., 2021; Gee et al., 2020; Zhang et al., 2023). These reviews may provide greater transparency in underlying study quality and may provide more detailed insights into the magnitude of effects and underlying factors related to effects. Considerations about these interventions should weigh our reported effect estimates and confidence in them with other factors, such as possible desirable and undesirable effects on other outcomes, impacts on health equity, resource requirements, feasibility to implement, acceptability to stakeholders, and opportunity costs (Moberg et al., 2018). For instance, school and district decision-makers—including teachers, principals, behavioral health specialists, and district leadership—often prioritize details about local context and programmatic considerations for assessing program fit with decision-makers' students and schools (Lyon & Bruns, 2019).

Implications for Future Research

Our assessments of review quality and meta-analytic risk of bias suggest a new systematic review may be warranted to provide users of this evidence base with an up-to-date synthesis of the literature and to overcome methodological limitations of existing reviews. For instance, this systematic review could provide estimates of evidence directly of interest to stakeholders: that is, depression-focused prevention interventions (as current reviews often covered anxiety-focused interventions along with depression-focused interventions) and interventions delivered during the school day (as current reviews often lumped interventions delivered during the school day with those delivered on school premises but outside of normal school hours). In addition, this review could address reasons for lower AMSTAR-2 and ROBIS ratings in most reviews, such as a prospectively registered protocol and analysis plan, a comprehensive search strategy (including gray literature and studies not published in English), incorporation of satisfactory tools for risk of bias assessment into syntheses, and use of formal approaches to rating and communicating certainty of evidence that incorporate considerations of study limitations, imprecision, indirectness, inconsistency, and reporting bias (Guyatt et al., 2008; Santesso et al., 2020). In addition, future evidence synthesis research is needed to systematically review the evidence on other efficacy outcomes (e.g., participant engagement), safety and unintended negative consequences (e.g., iatrogenic effects), moderation by intervention characteristics (e.g., dose of the intervention and who delivered it), the implementability of these programs (e.g., their feasibility and cost requirements), and the degree to which programs were codesigned with youth who have lived experience of depression. To address many of these needs, we plan to conduct a new, standalone, living systematic review (Elliott et al., 2014, 2017) on school-based depression prevention interventions delivered to students during normal school hours. Our intention is for this living review to serve as the foundation for a meta-analytic research domain (Cuijpers et al., 2022) on school-based mental health prevention programs.

Strengths and Limitations

This overview has several strengths, including the use of explicit research questions and eligibility criteria, prospective registration of the review protocol, duplicate study selection and data collection, and established techniques to appraise reviews. However, there are several limitations worth noting. First, while we did not use any language restrictions in our search strategy, we did not have proficiency in languages other than English on our review team. In addition, we did not contact content experts and organizations for missing reviews nor search systematic review registries (e.g., PROSPERO, Open Science Framework) for completed or ongoing reviews. Future updates to this review can incorporate non-English publications, contact experts and organizations, and search review registries to identify additional systematic reviews with meta-analyses on school-based depression prevention interventions. Second, we did not contact systematic review authors to validate our methodological analysis (Faggion et al., 2023) or obtain missing information, nor did we reassess reported information, reanalyze data to conduct our own meta-analyses and sensitivity analyses, or independently obtain desired information when missing (e.g., conduct primary study risk of bias

assessments, calculate heterogeneity statistics, inspect publication bias, rate certainty of evidence). Third, we only collected information on the effects of interventions on depression outcomes. Future research should also appraise and synthesize information on other issues critical to the delivery of school-based depression prevention interventions, such as concerns about equity, feasibility of implementation, acceptability to key stakeholders, and resource requirements (Moberg et al., 2018). Finally, we did not include supplemental primary studies in this overview, limiting the evidence in this article to that synthesized and reported in existing systematic reviews. We also did not examine and manage discrepant data (i.e., data from the same primary study reported differently across eligible systematic reviews) during data collection and analysis.

Conclusion

School-based depression prevention programs may yield small yet possibly meaningful reductions in depression symptoms among primary and secondary school students on average. However, based on heterogeneity of effect estimates and limitations in existing meta-analyses and the primary studies that they included, conceptual use of this evidence base may be more appropriate than mandated use of this research evidence. High-quality primary and secondary research is still needed to better understand what works, for whom, and under what conditions. While implementing these interventions in contexts similar to those in the review may have positive impacts on average for students, educators and policymakers should remain cautious and continue to evaluate them for safety and efficacy. Finally, depression prevention programs are only one way that schools can try to help students, and it is important to manage expectations about what these programs can only accomplish; educational decision-makers should consider other ways to address student depression, such as structural interventions and indirect approaches (Cuijpers, 2022).

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Received February 14, 2024
Revision received September 6, 2024
Accepted September 10, 2024 ■