

Supplemental Material S1. PRISMA table.

Section	Topic	Item	Checklist Item
Title	Title	1	<p><i>Identify the report as a systematic review, meta-analysis, or both.</i></p> <p><u>A systematic review of interventions for multilingual preschools with speech and language difficulties</u></p>
Abstract	Structures summary	2	<p><i>Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.</i></p> <p>Purpose: <u>There is a shortage of information on evidence-based interventions for supporting young multilingual children</u> (background). <u>The purpose of this review was to identify interventions that have been evaluated with preschool-aged multilingual children with a speech and/or language disorder or who are at risk of poor speech, language, literacy, and/or educational outcomes</u> (objectives).</p> <p>Method: <u>This review considered speech, language, and early literacy interventions used with preschool-aged multilingual children with a speech and/or language disorder or who have been identified as being at risk of language difficulties</u> (PROSPERO ID: 165892). The following electronic databases were searched: <u>EBSCO (CINAHL Plus, ERIC, PsycINFO, Medline, Education) and Linguistics, Language, and Behavior Abstracts (LLBA)</u> (data sources). Data were extracted describing article, participant, methodological, and intervention variables, and <u>effect sizes</u> (synthesis methods). <u>The Council for Exceptional Children’s (CEC, 2014) standards for evidence-based practice were used to examine the quality of studies</u> (study appraisal).</p> <p>Results: <u>Fifty-six relevant studies were identified in 52 articles and these studies described 4,551 participants who had speech sound disorder (6 articles), developmental language disorder (11 articles) or were considered to be at risk (36 articles). The interventions targeted speech production (7 studies), language (45 studies), and early literacy (11 studies) skills. Most studies reported positive effects. Only 15 studies met all quality indicators specified by the CEC (2014) and these described 18 interventions targeting language and literacy skills. The only intervention with sufficient evidence to be considered an evidence-based practice was Nuestros Niños [Our Children] for children’s early literacy and phonological awareness skills.</u> (results).</p> <p>Conclusions: <u>A number of high-quality studies exist that describe speech, language and/or literacy interventions for preschool-aged multilingual children with a speech and/or language disorder, or who have been identified as being at risk of language difficulties.</u> (conclusions) <u>However, there remains limited evidence for specific interventions as to their ability to inform evidence-based practices</u> (implications).</p> <p>Not addressed in this abstract: Limitations</p>
Introduction	Rationale	3	<p><i>Describe the rationale for the review in the context of what is already known.</i></p> <p>See sections of introduction titled “Evidence-Based Practice with Multilingual Children” and “Objectives of this Systematic Review”</p>

Objectives	4	<p><i>Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).</i></p> <p>See section titled “Objectives of this Systematic Review”</p> <p>See Table 2 for PICO(TS) information</p>
Methods	Protocol and registration	<p>5 <i>Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.</i></p> <p>This systematic review registered with PROSPERO (ID 165892)</p>
Eligibility criteria	6	<p><i>Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.</i></p> <p><u>Exclusion Criteria</u></p> <ul style="list-style-type: none"> • Published before 1990. • Participants were not preschool-aged children. • Participants were not multilingual and did not have a speech and/or language disorder or were not identified as being at risk. • Participants had been diagnosed with difficulties or disabilities • Pre- and post-data from an intervention for targeting speech, language, and/or early literacy skills that measured children’s speech, language, and/or early literacy skills either through direct assessment or adult report was not provided. • Only qualitative pre- and post-data from an intervention was provided. • Research articles were not published in a peer-reviewed journal. • Full text of the article could not be obtained. <p>Note: The language in which the article was published was not an exclusion criterion.</p>
Information sources	7	<p><i>Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.</i></p> <p>Electronic database search in October 2019 (original search) and April 2021 (forward search): EBSCO (CINAHL Plus, ERIC, PsycINFO, Medline, Education) and Linguistics, Language, and Behavior Abstracts (LLBA).</p> <p>Supplemental Search 1: Table of contents of all issues of the following journals between 1990 and 2021 were hand searched: American Journal of Speech-Language Pathology; American Speech-Language-Hearing Association Special Interest Group publications (1 Language Learning and Education; 14 Cultural and Linguistic Diversity; 17 Global Issues in Communication Sciences and Related Disorders), Child Language Teaching and Therapy; Clinical Linguistics and Phonetics; Communication Disorders Quarterly; International Journal of Bilingual Education and Bilingualism; International Journal of Language and Communication Disorders; International Journal of Speech-</p>

		<p>Language Pathology; Journal of Communication Disorders; Journal of Speech, Language, and Hearing Research; Language, Speech, and Hearing Services in Schools; Seminars in Speech and Language; Speech, Language and Hearing; Topics in Language Disorders.</p> <p>Supplemental Search 2: The reference lists of articles included in this systematic review and review articles identified in the search for additional references which may meet the inclusion criteria for this systematic review.</p> <p>Note: There was no contact with study authors</p>
Search	8	<p><i>Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.</i></p> <p>See Supplementary Material: Search Strategy</p>
Study selection	9	<p><i>State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).</i></p> <p>Study selection for qualitative synthesis: See Item 6</p> <p>Study selection for classification of evidence: Inclusion in consideration for evidence-based interventions required studies to meet all of the quality indicators relevant to their research design to be considered for inclusion as according to the Council for Exceptional Children (2014) guidelines.</p> <p>Council for Exceptional Children. (2014). Council for Exceptional Children: Standards for evidence-based practices in special education. <i>Teaching Exceptional Children</i>, 46(6), 206-212. doi:10.1177/0040059914531389</p>
Data collection process	10	<p><i>Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.</i></p> <p>Data extraction: Data were extracted from included articles independently by the first two authors and entered into a spreadsheet. The only variation to this was for article in languages other than English, where the first author screened the full text using her own knowledge of the languages and assisted by Google translate where necessary. This author then extracted as much of the data from the article as possible, using the method described below, and sent the paper and preliminary extracted data to a professional fluent in the language for verification of extracted data and extraction of additional data. Reliability was not considered for article screening or data extraction as these processes were completed independently by two authors and discussion of all differences occurred until consensus was reached.</p> <p>Study quality: The first, third, and fourth authors assessed study quality by making judgements for each study for every relevant item of the CEC (2014) guidelines. These authors all had PhDs and experience conducting and evaluating research quality. Reliability for quality analysis occurred for 34 of the 56 studies (60.7%), which included 12 randomly selected studies (21%) and all 25 (44.6%) studies that were within two points of a perfect score on the CEC quality guidelines. Point-by-point interrater reliability was 92.3% (61 differences across 788 data points).</p>

	Data items	11	<i>List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.</i> See Tables 1 and 2
	Risk of bias in individual studies	12	<i>Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.</i> Risk of bias was not explicitly examined in this review. Bias in individual studies was identified by application of the Council for Exceptional Children’s (2014) quality indicators. The results of these are shown in Supplementary Material (Study Information) for individual studies, and Supplementary Material (CEC Table) for the entire sample.
	Summary measures	13	<i>State the principal summary measures (e.g., risk ratio, difference in means).</i> Effect sizes were extracted or calculated for each study considering the outcome measured and the language each outcome was measured in. These data for all studies are presented in Supplementary Material (EBP Table)
	Synthesis of results	14	<i>Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.</i> Meta-analysis was not conducted.
	Risk of bias across studies	15	<i>Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).</i> Risk of bias across studies was not formally assess in this review, but this is addressed in the discussion under “Limitations of the Literature”.
	Additional analyses	16	<i>Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.</i> No additional analyses were conducted.
Results	Study selection	17	<i>Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.</i> See Figure 1.
	Study characteristics	18	<i>For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.</i> See Supplementary Material (Study Information).
	Risk of bias within studies	19	<i>Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).</i> See Supplementary Material (Study Information).
	Results of individual studies	20	<i>For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.</i>

			Effect sizes are presented for each intervention in Supplementary Material (EBP Table).
	Synthesis of results	21	<i>Present results of each meta-analysis done, including confidence intervals and measures of consistency.</i> A meta-analysis was not conducted.
	Risk of bias across studies	22	<i>Present results of any assessment of risk of bias across studies (see Item 15).</i> Bias was not formally assessed (see Item 15)
	Additional analysis	23	<i>Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).</i> No additional analyses were conducted.
Discussion	Summary of evidence	24	<i>Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).</i> The main outcome was that only one intervention met the criteria for evidence-based intervention and only for two outcomes: “Only one intervention met the criteria for informing the evidence-base for practice, Nuestros Niños School Readiness Program (Buysse et al., 2010; Castro et al., 2017), and only for outcomes related to early literacy and phonological awareness. All the effect of interventions on all other sub-domains were classified as either potentially informing EBP or as currently having insufficient evidence to be considered as informing EBP. This review concludes that there is need for rigorous planning, implementation, and reporting in future studies of interventions for speech, language, and early literacy skills in multilingual preschool-aged children with a speech or language disorder or at risk for poor educational outcomes in these areas”.
	Limitations	25	<i>Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).</i> Limitations of the literature: see section titled “Limitations of the Literature” Limitations of this review: see section titled “Limitations of this Review”
	Conclusions	26	<i>Provide a general interpretation of the results in the context of other evidence, and implications for future research.</i> Implications for future research: see section titled “Recommendations for the Literature”
Funding	Funding	27	<i>Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.</i> Financial Disclosure: This project was conducted in the course of the authors’ usual employment and did not receive external funding. Authorship Disclosure (CRediT Author Statement): <ul style="list-style-type: none"> • Kathryn Crowe: Conceptualization, methodology, formal analysis, investigation, resources, data curation, writing (original draft), writing (review and editing), supervision, project administration. • Sisan Cuervo: Conceptualization, methodology, formal analysis, investigation, writing (original draft), writing (review and editing).

- Mark Guiberson: Conceptualization, methodology, investigation, writing (review and editing), supervision.
- Karla Washington: Conceptualization, methodology, investigation, writing (original draft), writing (review and editing).

Note. Italicized text is a direct quotation from Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & the PRISMA Group. (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA statement. *Annals of Internal Medicine*, 151(4), 264-269. <https://doi.org/10.1059/0003-4819-151-4-200908180-00135>