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### Three Decades of Research: The Case for Comprehensive Sex Education

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Review article

## Three Decades of Research: The Case for Comprehensive Sex Education

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*Article history:* Received February 3, 2020; Accepted July 22, 2020

*Keywords:* Sex education; Sexuality education; National Sex Education Standards; National Sexuality Education Standards; CSE; comprehensive sex education; Systematic Literature Review; K-12



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### A B S T R A C T

**Purpose:** School-based sex education plays a vital role in the sexual health and well-being of young people. Little is known, however, about the effectiveness of efforts beyond pregnancy and sexually transmitted disease prevention. The authors conducted a systematic literature review of three decades of research on school-based programs to find evidence for the effectiveness of comprehensive sex education.

**Methods:** Researchers searched the ERIC, PsycINFO, and MEDLINE. The research team identified papers meeting the systematic literature review criteria. Of 8,058 relevant articles, 218 met specific review criteria. More than 80% focused solely on pregnancy and disease prevention and were excluded, leaving 39. In the next phase, researchers expanded criteria to studies outside the U.S. to identify evidence reflecting the full range of topic areas. Eighty articles constituted the final review.

**Results:** Outcomes include appreciation of sexual diversity, dating and intimate partner violence prevention, development of healthy relationships, prevention of child sex abuse, improved social/emotional learning, and increased media literacy. Substantial evidence supports sex education beginning in elementary school, that is scaffolded and of longer duration, as well as LGBTQ-inclusive education across the school curriculum and a social justice approach to healthy sexuality.

**Conclusions:** Review of the literature of the past three decades provides strong support for comprehensive sex education across a range of topics and grade levels. Results provide evidence for the effectiveness of approaches that address a broad definition of sexual health and take positive, affirming, inclusive approaches to human sexuality. Findings strengthen justification for the widespread adoption of the *National Sex Education Standards*.

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### IMPLICATIONS AND CONTRIBUTION

Attention to the full range of sexual health topics, scaffolded across grades, embedded in supportive school environments and across subject areas, has the potential to improve sexual, social, and emotional health and academic outcomes for young people.

Public health practitioners and policy-makers have long considered school-based sex education to play a vital role in the sexual health and well-being of young people. Likewise, surveys

of the public over several decades have consistently shown strong support for comprehensive sex education (CSE; also known as comprehensive sexuality education) [1]. Nevertheless,

**Conflicts of interest:** Funding for this project was provided by the Grove Foundation. The sponsor was not involved in the study design, collection or analysis of data, or writing of the report, but funded the project with the intention of a systematic literature review for publication. The authors worked directly with the Future of Sex Education to identify the scope of the study.

Future of Sex Education reviewed an earlier draft of the article for the purpose of assuring accuracy related to discussion of the National Sex Education Standards.

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except for evaluations of sexually transmitted infection (STI) and pregnancy prevention programs, not enough is known about the effectiveness of sex education efforts, which have the potential to influence adolescent health in a variety of ways. This paper describes the results of a literature review of three decades of research on the effectiveness of school-based programs, from both the U.S. and around the world, that focus on a range of outcomes associated with CSE.

## Background

Sex education has long been characterized by competing definitions, goals, and philosophies, which has muddied efforts to understand and gauge its effectiveness [2]. When it comes to measuring impact and outcomes, research has been dominated by interest in prevention programs aimed at reducing STI and pregnancy rates [3–9]. These prevention programs put emphasis on sexual behaviors and behavior change as the main focus of analysis [10]. What has remained largely unstudied, however, are approaches with a broader and more comprehensive focus on human sexuality, defined by SIECUS as:

“...the sexual knowledge, beliefs, attitudes, values, and behaviors of individuals. Its various dimensions involve the anatomy, physiology, and biochemistry of the sexual response system; identity, orientation, roles, and personality; and thoughts, feelings, and relationships” [11].

In 2012, the Future of Sex Education, a partnership among three leading national sex education organizations, Advocates for Youth, Answer, and SIECUS, released the *National Sexuality Education Standards* (NSES) [12]. These were updated in 2020, as the *National Sex Education Standards, Second Edition* [13]. The goal of the NSES is to provide school districts with “clear, consistent, and straightforward guidance on the essential, minimum, core content, and skills needed for sex education that is age-appropriate for students in Grades K-12 to be effective” [13]. It consists of the following seven topic areas: *Consent and Healthy Relationships, Anatomy and Physiology, Puberty & Adolescent Sexual Development, Gender Identity and Expression, Sexual Orientation and Identity, Sexual Health, and Interpersonal Violence* [13].

Since the initial publication of the NSES, school districts across the country have been relying on these standards to develop and implement CSE, with recent data suggesting that more than 40% of districts in the U.S. have adopted the NSES [14]. Along with increasing dependence on the NSES has come growing and renewed interest in the evidence that supports their use.

## Methods

The authors conducted a Systematic Literature Review (SLR) dating back to 1990 to find evidence for the effectiveness of CSE. The year 1990 represents a fundamental shift in the field of sex education as evidenced by the publication in 1991 of the *SIECUS Guidelines for Comprehensive Sexuality Education Kindergarten through 12th Grade* [15]. The *Guidelines* provided the first national framework for the concepts, topics, and skills that should be taught to young people at different ages and grade levels. As such, they were the precursor to the NSES and can justifiably be seen as representing the beginning of the “modern era” of CSE.

The SLR was designed to cast a wide and inclusive net to assure that all aspects of CSE were included. The criteria for the initial search were as follows: (1) qualitative or quantitative

studies evaluating outcomes of school-based, K-12 educational approaches; (2) both within sex education and across the curriculum; and (3) that were U.S. based.

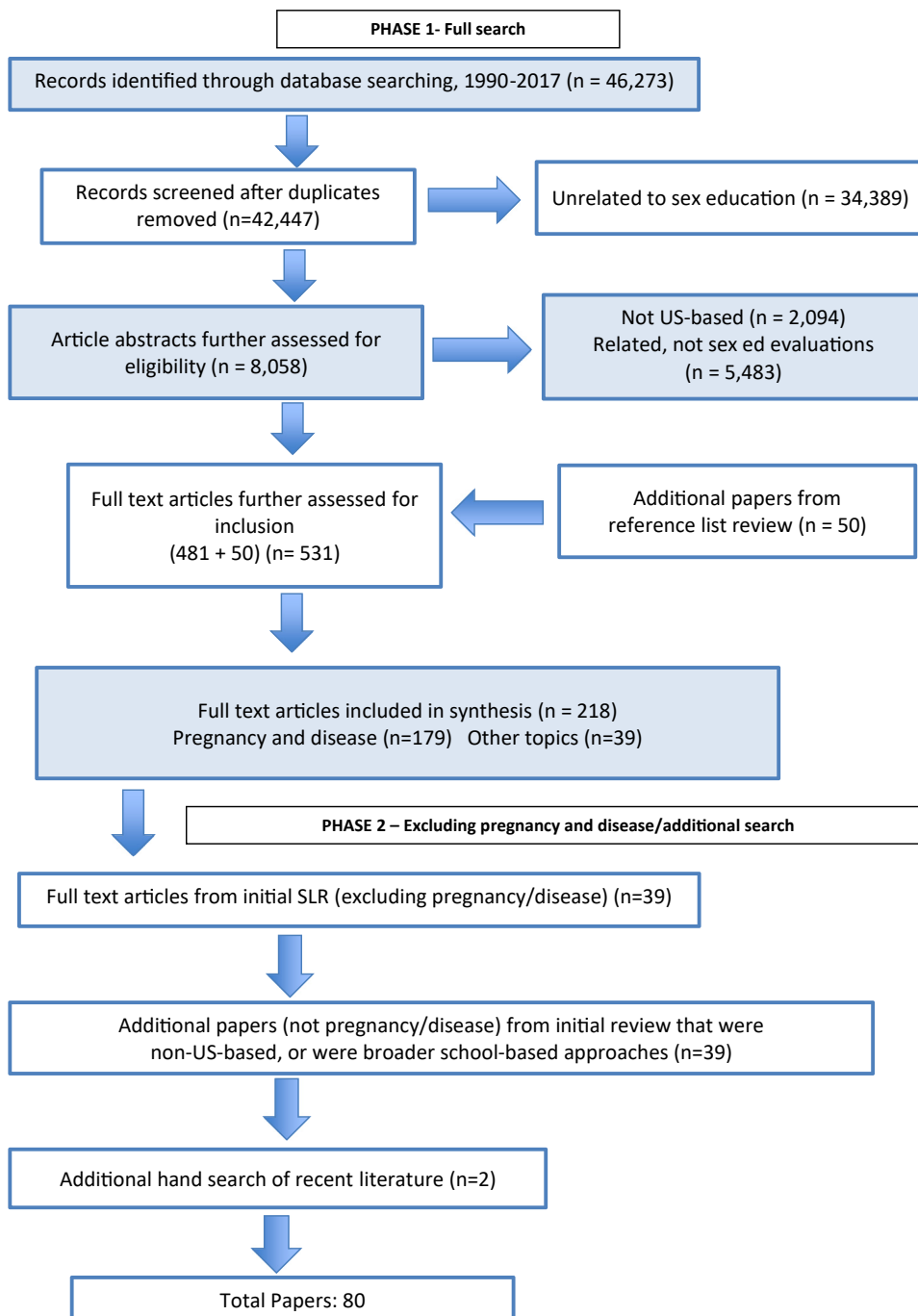
In consultation with the research team, an information specialist, experienced in SLR searches, developed and tested the strategy using an iterative process. ERIC and PsycINFO were searched on the Ebsco platform, as well as MEDLINE on Web of Science. All searches were performed on December 14, 2017. Strategies used a combination of controlled vocabulary (e.g., “Sex Education,” “Schools,” and “Sexual Health”) and keywords (e.g., “curriculum,” “K-12,” and “LGBTQ”; the search terms included both common acronyms [e.g., LGBTQ and STI] as well as the individual words [e.g., LGBTQ, sexually transmitted infections, etc.]). The initial list of terms was derived from the 2012 NSES. The research team added terms they deemed important based on their expertise in the field of sex education, and then the entire list was reviewed independently by an outside group of sex education experts for accuracy and thoroughness. Vocabulary and syntax were adjusted across the selected databases. All searches were limited to the English language.

A team of four graduate research assistants and the authors reviewed the first 1,500 records to develop and refine the coding strategy. Using article title and abstract, a coding scheme was developed: (1) articles that met the specified criteria for the SLR; (2) articles that needed further review to determine eligibility (and then recoded accordingly); (3) articles that were completely unrelated to the subject and eliminated. With an eye toward potential expansion of the review, two additional categories were coded: (4) articles that were non-U.S. based, but otherwise met the inclusion criteria; and (5) articles that were related to the topic of sex education, but did not meet the specified criteria.

Next, in teams of two, research assistants coded the remaining records. After scoring them independently, partners met to compare codes. Interrater reliability for papers coded 1 or 2 was calculated after review of 25% of the records, with 96% agreement for both of the teams. The lead researchers were called on to reconcile differences.

The search results are summarized in the PRISMA diagram [16] (Figure 1). Because the search intentionally identified material that broadly met the concepts of CSE, the initial result included more than 46,000 records, deduplicated to 42,447. After eliminating articles that were completely unrelated to the topic, 8,058 papers remained. Among those, 481 met the initial criteria for the SLR, 2,094 were non-U.S. based, and 5,483 were related to sex education, but were not school-based evaluations. These 481 papers, plus 50 additional articles from review of references, were read in full text, resulting in 218 remaining in the “1” category. Among those, 179 focused solely on pregnancy and disease prevention approaches, and 39 focused on other CSE topics delineated in the NSES. Given the breadth and sheer number of studies, and in the interest of drawing conclusions about the broader impact of CSE, the researchers decided to exclude studies focused only on pregnancy and disease prevention programs. The ample literature reflecting the effectiveness of sex education in helping young people lower their risk of unplanned pregnancy, STIs, and HIV is the subject of another article.

In the next phase of the review, the team expanded the criteria to include evaluation studies that were coded as 4 (non-U.S.) or 5 (related to CSE, such as school-wide initiatives) and also met review criteria as evaluation studies of school-based programs. After completion of this process, two research assistants



**Figure 1.** PRISMA diagram of the literature search.

conducted a targeted online search of the literature, excluding pregnancy and STI prevention studies, for research published after the initial search was conducted through November 2019. A total of 80 articles constitute the final set for this review.

The researchers identified the outcomes in each study and then sorted those outcomes into several overarching categories based on commonly identified aims of CSE. These were identified as appreciation of sexual diversity, dating and intimate partner violence (IPV) prevention, development of healthy relationships, and prevention of child sex abuse. Within these overarching

categories, several subtopics emerged that correspond with widely recognized goals of CSE [10,11,13,15]. Figure 2 identifies the number of outcomes reported for each overarching category. Several studies were counted in more than one category.

## Results

The studies that form the basis of this review vary widely in their size, rigor of analysis, and generalizability of findings. They include methodologically strong studies, using quasi-experimental

or experimental designs, as well as meta-analyses and SLRs. They also include a substantial number of studies with less rigorous designs, smaller samples, and/or more qualitatively based approaches that when taken together lead to strong evidence of outcomes. Table 1 provides details for the outcome studies reviewed here including methodology and alignment of outcomes with the NSES topic areas [13].

A notable update in the NSES Second Edition is a prominent focus on social justice and equity, as well as intersectionality. Some of the findings of this SLR reflect this broader conceptual focus and are reported as such here.

#### Appreciation of sexual diversity

Studies discussed in this section report on outcomes that together represent appreciation of sexual diversity. Classroom approaches ranged from preschool through grade 12, were found throughout the curriculum (not just in health or sex education), and included, in many cases, the use of literature to address gender and sexual orientation issues. Research on LGBTQ-inclusive curricula across topics and grade levels are reviewed, as well as approaches aimed specifically at reducing homophobia, homophobic bullying and harassment, and other outcomes related to appreciation of sexual diversity.

**Lower homophobia.** Curricula designed specifically to reduce homophobia have been found to be successful across grade levels using a variety of approaches both formally within sexuality education and throughout other areas of the curriculum [17–27]. Programs that brought in guest speakers from the LGB community to share personal stories resulted in reduced homophobic attitudes [18,19]. A Quebec study using immediate post-tests and 3-month follow-ups, as well as participant interviews and focus groups, reported on 227 high school (HS) students who participated in a program in which a gay man and a lesbian spoke in their classrooms. Students exhibited increased normalization of lesbian and gay people, a reduction in stereotyping about gender expression and norms for lesbian and gay women and men, empathy for those who come out, an appreciation for the positive

aspects of being lesbian and gay, a recognition that sexual orientation does not have to correlate with sexual behavior, and lower use of homophobic slurs [19]. Strategies that use literature featuring gay and lesbian characters have also resulted in lowered homophobia and homophobic behaviors both at the elementary school level [17] and in high school [20,22,23].

**Reduced homophobic bullying.** In addition to reduced homophobic attitudes, research demonstrates that curricula that are inclusive of all sexual orientations, gender identities, and expressions, across areas of study, and most strongly within CSE, reduce homophobic bullying and harassment, and increase safety for LGBTQ students [19,28,29].

A 2015 survey of 1,232 gay and straight middle and high school students from 154 schools in California found that inclusive curricula were associated with higher reports of safety at both the individual and school levels and lower levels of bullying at the school level. LGBTQ-supportive curricula were also related to students feeling safer at school and more aware of bullying at both the school and individual levels. Although these outcomes resulted from inclusiveness throughout the curriculum, the study found that having sex education and health classes that were LGBTQ inclusive had the greatest impact on school climate [28].

A rigorous, three-wave longitudinal study examined an LGBTQ-inclusive curriculum in six Dutch high schools provided to 601 tenth- to twelfth-grade students. Researchers found that, along with covering a variety of topics, inclusion of sexual orientation and gender identity that was extensive in both content and frequency predicted decreased name-calling and, among girls, increased willingness to intervene when witnessing name-calling by others, leading to an improved school climate [29]. Other methodologically strong studies have found that LGBTQ-inclusive sex education is related to lower reports of adverse mental health (suicidal thoughts and suicide plans) among all youth and of experiences of bullying among sexual minority youth [30]. As well, they are related to better health outcomes among gay, lesbian, and bisexual students, including fewer sex partners, less use of drugs or alcohol before sex, less pregnancy, and better school attendance [31].

**Expanded understanding of gender/gender norms.** Although research suggests that narrow views of gender and the reinforcement of gender stereotypes in young children can lead to gender-based harassment [32], little evaluation research has looked at efforts to counteract these views. A few smaller studies, including qualitative/ethnographic research and studies looking at short-term or single-dose programs, taken together, suggest that focused efforts to increase acceptance of transgender and gender-nonconforming people can be effective [19,33,34]. Qualitative studies of efforts to expand understanding of gender and gender norms, all at the elementary school level (third to fifth grades), suggest that making children's literature that challenges gender stereotypes available and accessible to students may not be enough. Using that literature to engage students in discussions, relating gender-based bullying and harassment to harassment and oppression of other marginalized populations, and using a critical literacy approach [97] engaged students in different ways of thinking about and expressing the messages from these books and other media. They also helped young children to expand their views of gender, gender expression, and gender norms and created an environment that

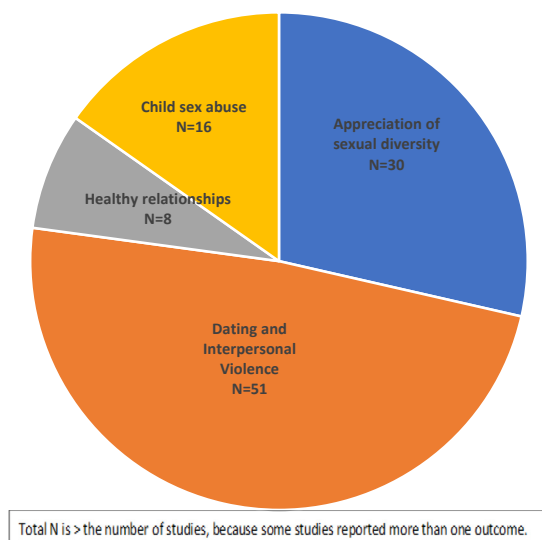


Figure 2. Outcomes in each major topic area.

**Table 1**  
Details about outcome studies identified in the review

Authors and References	Year	Country	Study population and size	Study design	Outcome sub-topics <sup>a</sup>	Corresponding NSES topic
Schall and Kauffmann [17]	2003	USA	29; 4th and 5th graders	Qualitative, class discussion	1, 3	SO
Eick et al. [18]	2016	Israel	272; 9th to 11th graders and three high schools	Nonexperimental, paired pre- and post-test	1, 3	SO
Richard et al. [19]	2015	Canada	277; 9th to 12th graders	Nonexperimental, paired pre- and post-tests	1, 2, 13	SO, GI
Athanases [20]	1996	USA	21; 10th graders	Qualitative, class discussion, and interviews	1, 3, 5, 13	SO
Van de Ven [21]	1995	Australia	130; 9th graders	Nonexperimental, pre- and post-test with 3-month follow-up	1	SO
Helmer [22]	2015	USA	24; 11th and 12th graders	Qualitative, student questionnaires and interviews	1, 3, 5	SO, GI
Helmer [23]	2016	USA	24; 11th and 12th graders	Qualitative, ethnographic student and teacher interviews, observations and artifacts	1, 3, 5	SO, GI
Alan and Miriam [24]	2011	USA	1,613 students and 19 staff members, middle schools	Mixed methods, nonexperimental student surveys, staff focus groups	3	SO
Bentley and Souto-Manning [25]	2016	USA	1 preschool class	Qualitative, class discussion	3, 4, 5	SO
Lucassen and Burford [26]	2015	New Zealand	229; 9th and 10th graders (aged 12–15 years)	Nonexperimental, paired pre- and post-tests	3, 13	SO
Brown et al. [27]	1991	USA	2,709; 7th to 12th graders	Experimental, pre- and post-test	3, 4	SO
Snapp et al. [28]	2015	USA	1,232 high school and middle school students (aged 12–18 years)	Qualitative survey	2	SO
Baams et al. [29]	2017	The Netherlands	601; 10th to 12th graders	Quasi-experimental, longitudinal, surveys	2	SO, GI
Proulx et al. [30]	2019	USA	47,000; 9th to 12th graders, from 11 states	Multilevel modeling of YRBS and School Health Profiles	2	SO
Blake et al. [31]	2001	USA	3,647; 9th to 12th graders	Multistage cluster sample from 63 schools, YRBS data	2	SO
Hill and Kearl [32]	2011	USA	1,965; 7th to 12th graders	Qualitative, survey	4	GI
Ramirez-Valles et al. [33]	2014	USA	44; 9th to 12th graders	Nonexperimental, paired pre- and post-tests	3, 4	SO, GI
Ryan et al. [34]	2013	USA	1; 3rd grade class, 1 teacher	Qualitative; class discussions, informal interviews	3, 5	SO, GI
Rice [35]	2002	USA	24; 3rd graders	Qualitative, class discussion	4	GI
Dutro [36]	2002	USA	24; 5th graders	Qualitative, class discussion	4	GI
Hermann-Wilmarth et al. [37]	2017	USA	15; 4th to 5th graders	Qualitative, class discussion	4, 5	SO, GI
Knotts and Gregorio [38]	2011	USA	101; 9th to 12th graders	Nonexperimental, paired pre- and post-test. Class discussion	5	SO, GI
Matthews et al. [39]	1998	USA	22; 5th graders	Qualitative, class discussion	5	GI
Smylie et al. [40]	2008	Canada	240; 9th graders, 6 schools	Quasi-experimental, pre- and post-test surveys	5	GI, CHR, AP
Constantine et al. [41]	2015	USA	1,750; 9th graders, 10 high schools	Experimental, pre- and post-test	5, 13	GI, CHR
Rohrbach et al. [42]	2015	USA	1,447; 9th graders, 10 high schools	Experimental, pre, post, and 1-year follow-up	5	GI, CHR
Barker et al. [43]	2010	USA	Varied	Systematic literature review of 58 evaluation studies	5	GI
Baiocchi et al. [44]	2017	Kenya	6,356 girls aged 10–16 years, 30 primary schools	Experimental, pre- and post-test	5, 7	GI, CHR
Miller et al. [45]	2012	USA	1,798; 9th to 12th grade boys, 16 high schools	Experimental, pre and 3-month follow-up post-test	5, 8	GI, IV
Haberland [46]	2015	USA	Varied	Systematic literature review of 22 evaluation studies	5	IV, GI, SH
Ting [47]	2009	USA and Canada	13 middle and high schools	Meta-analysis of knowledge and attitudes	6, 7	IV
Foshee et al. [48]	2004	USA	460; 8th graders	Experimental, pre, post, and long-term follow-up	7	IV
Foshee et al. [49]	1998	USA	1886; 8th to 9th graders, 14 schools	Experimental, pre-, post-test, 1-month follow-up	6, 7, 13	IV
Crooks et al. [50]	2015	Canada	1,012; 7th and 8th graders, 57 schools	Experimental, pre-, post-test (1 month after program)	6, 7	IV
Foshee et al. [51]	2000	USA	1886; 9th to 9th graders, 14 schools	Experimental, pre, post, 1-year follow-up	6, 7, 13	IV, CHR
Kervin and Obinna [52]	2010	USA	49 HS students	Nonexperimental, pre and post-tests	6, 7, 8	IV, GI

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**Table 1**  
Continued

Authors and References	Year	Country	Study population and size	Study design	Outcome sub-topics <sup>a</sup>	Corresponding NSES topic
Wolfe et al. [53]	2012	Canada	196; 9th grade girls	Experimental, observational post-test substudy of students in a larger randomized trial	10	CHR
Peskin et al. [54]	2014	USA	766; 7th to 9th graders, 10 middle schools	Experimental, pre- and post-test	7	IV
Rice et al. [55]	2017	USA	3,658; 9th to 12th graders, 30 high schools	Nonexperimental repeated measure surveys	8, 9, 13	CHR
Taylor et al. [56]	2010	USA	1,639; 6th to 7th graders, 3 middle schools	Experimental, pre- and post-test with 5–6 month follow-up	6, 7	IV
Pacifici et al. [57]	2001	USA	457; 9th to 12th graders, 2 high schools	Experimental, pre and 10-day follow-up post-test	7	IV
De La Rue et al. [58]	2014	USA	Grades 4–12	Systematic literature review, 23 programs	6, 7	IV
Smith and Welchans [59]	2000	USA	253; 10th to 12th graders	Nonexperimental, unpaired pre- and post-test	6	IV
Sosa-Rubi et al. [60]	2017	Mexico	885; 9th to 12th graders, 2 high schools	Quasi-experimental, matched pairs, pre- and post-tests	5, 6	IV
Baker et al. [61]	2014	USA	136; 9th to 12th graders, 2 high schools	Quasi-experimental, unpaired pre- and post-test with 1-month follow-up	6, 8	IV
Macgowan [62]	1997	USA	440; 6th to 8th graders	Experimental, pre- and post-test	6	IV
Meyer and Stein [63]	2004	USA	Varied, 6th to 12th graders	Literature review of five programs	6, 7	IV
Weisz and Black [64]	2001	USA	66 African-American 7th graders	Quasi-experimental, unpaired pre- and post-test with 6-month follow-up	6	IV
McLeod et al. [65]	2015	USA	291; 9th graders, 3 high schools	Nonexperimental, unpaired pre- and post-test	6, 9	IV, CHR
Adler-Baeder et al. [66]	2007	USA	340; 9th to 12th graders, 9 high schools	Quasi-experimental, paired pre- and post-test	6, 7	IV
Jaycox et al. [67]	2006	USA	2,540; 9th graders, 10 high schools	Experimental, pre- and post-test with 6-month follow-up	6	IV
de Lijster et al. [68]	2016	The Netherlands	815; students, aged 12–16 years, 25 schools	Experimental, pre- and post-test with 6-month follow-up	6	IV
Roscoe et al. [69]	1994	USA	561; 7th and 8th graders	Nonexperimental, pre and post-tests	6	IV
Kernsmith and Hernandez-Jozefowicz [70]	2011	USA	343; 9th to 12th graders	Nonexperimental, unpaired pre- and post-test with 3-month follow-up	6	IV
Wolfe et al. [71]	2009	Canada	1,722; 9th graders, 20 high schools	Experimental, pretest with 2.5 year follow-up	7	IV
Mathews et al. [72]	2016	South Africa	3,451; 8th graders, 42 schools	Experimental, pretest with 6-month and 12-month follow-up	7	IV
Bates [73]	2006	USA	97; 7th graders	Nonexperimental comparison of pre-during, and post discipline referrals	7	IV
Ketry et al. [74]	2017	USA	27 studies, five were HS	Meta-analysis of experimental and quasi-experimental studies, Grades 7–12 and college	8	IV
Miller et al. [75]	2013	USA	1,798; 9th to 12th grade boys, 16 high schools	Experimental, pre and 3-month follow-up post-test	5, 8	GI, IV
Pick et al. [76]	2007	Mexico	1,581; 4th graders, 45 elementary schools	Experimental pre- and post-test	10, 13	CHR
Buote and Berglund [77]	2010	Canada	1,748; 7th to 10th graders, 31 schools	Nonexperimental, unpaired pre- and post-test	10, 13	CHR
Lamb and Randazzo [78]	2016	USA	79; 9th graders	Nonexperimental, unpaired pre- and post-test	10	CHR
Scull et al. [79]	2014	USA	56; 8th graders	Nonexperimental, unpaired pre- and post-test	10, 14	CHR, SH
Davis and Gidycz [80]	2000	USA	27 studies	Meta-analysis of experimental and quasi-experimental studies, aged 3–13 years	11, 12	CHR
Kenny et al. [81]	2008	USA and Canada	Age 3–12 years	Systematic literature review, 21 articles focused on five different programs	11, 12, 13	CHR
Macintyre and Carr [82]	1999	Ireland	727; 2nd and 5th graders across 5 schools	Experimental, randomized by school, pre, post, follow-up	11, 12, 13	CHR, SH

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**Table 1**  
Continued

Authors and References	Year	Country	Study population and size	Study design	Outcome sub-topics <sup>a</sup>	Corresponding NSES topic
Walsh et al. [83]	2018	USA, Canada, China, Germany, Spain, Taiwan, Turkey	5,802 K-5 students across 24 studies	Systematic literature review	10, 11	CHR
Topping and Barron [84]	2009	USA, Canada, UK, Ireland, Holland	Varied, K-6	Systematic literature review of 22 studies	11, 13	CHR, SH
Pulido et al. [85]	2015	USA	492; 2nd and 3rd graders across 6 schools	Experimental, pre- and post-test	11	CHR
Baker et al. [86]	2012	USA	80; 3rd and 4th graders across 3 schools	Quasi-experimental, pre- and post-test	11	CHR
Hazzard et al. [87]	1991	USA	399; 3rd and 4th graders across 6 schools	Experimental, randomized by school	11	CHR
Brown [88]	2016	USA	1,169; K students across 54 classrooms in four school districts	Nonexperimental, unpaired and paired pre- and post-test	11	CHR
Kenny et al. [89]	2012	USA	123; PreK students aged 3–5 years	Quasi-experimental unpaired pre, post, and 3-month follow-up	11	CHR
Jin et al. [90]	2017	China	484; 1st to 5th graders in one primary school	Experimental, pre, post and 12-week follow-up	12	CHR
Kim and Kang [91]	2017	South Korea	89; 5th graders across 3 schools	Quasi-experimental with pre- and post-test	12	CHR
Kater et al. [92]	2002	USA	415; 4th to 6th graders across 5 schools	Quasi-experimental pre- and post-test	13	SH
Halliwell et al. [93]	2016	UK	144; students aged 9–10 years across 4 schools	Quasi-experimental pre and post-test with 3-month follow-up	13	SH
Dunstan et al. [94]	2017	Australia	200; 7th grade girls	Quasi-experimental pre and post-test with 6-month follow-up	13	SH
McCabe et al. [95]	2010	Australia	421; 7th to 9th grade boys aged 11–15 years across 5 schools	Quasi-experimental pre and post-test with 3, 6, and 12-month follow-up	13	SH
Berman and White [96]	2013	Australia	48; 8th graders across 3 schools	Nonexperimental, pre- and post-test	13, 14	CHR, SH

CHR = consent and healthy relationships; AP = anatomy and physiology; PD = puberty and adolescent sexual development; GI = gender identity and expression; SO = sexual orientation and identity; SH = sexual health; IV = interpersonal violence; YRBS = Youth Risk Behavior Surveillance.

<sup>a</sup> Outcome Subtopics: Appreciation of sexual diversity: 1 = lower homophobia; 2 = reduced homophobic bullying; 3 = expanded understanding of gender/gender norms; 4 = recognition of gender equity, rights, social justice. Dating and intimate partner violence: 5 = improved knowledge and attitudes about, and reporting of, sexual and intimate partner violence; 6 = decreased sexual and intimate partner violence perpetration and victimization; 7 = increased bystander intentions and behaviors. Healthy relationships: 8 = increased relationship knowledge, attitudes, and skills; 9 = improved communication skills and intentions. Child sex abuse: 10 = improved knowledge, attitudes, skills, and social-emotional outcomes related to personal safety and touch; 11 = improved disclosure skills and behaviors. Additional outcomes: 12 = social-emotional learning; 13 = media literacy.

allowed students to challenge and to cross their own stereotypical gender boundaries safely [34–37].

In one participant-observation study of a literature-based gender norms curriculum with suburban, Midwest African-American fifth graders [36], the author reported that “over time...both girls and boys felt safe in discussing and challenging one another’s assumptions about gender’s role in their reading choices” (p. 384) and concluded, “Children need safe spaces in which to experience, play with, and begin to challenge the naturalized assumptions about gender.” (p. 384). The studies noted here, as well as one of a preschool class [25], highlight that young children are, in fact, quite capable of understanding and discussing issues related to gender diversity, including gender expectations, gender nonconformity, and gender-based oppression. They also underscore that the development of such understanding requires instructional scaffolding over a period, and not just one session.

*Recognition of gender equity, rights, and social justice.* The use of social justice and rights-based frameworks in designing and

teaching topics related to sexuality and sexual health has increased over the past several years and has been advocated by leading sexual health organizations [13,98]. A social justice lens uses the concepts of human rights and equality through which to challenge power, privilege, and structural and systemic discrimination of marginalized communities. There is evidence to suggest that this approach is well-founded and can be applied across the curriculum and at all grade levels [20,22,37,38,99]. A number of studies report outcomes related to increased knowledge, awareness and appreciation of gender equity and sexual rights, and awareness of discrimination and oppression based on gender and sexual orientation [20,22,23,25,34,37–41].

The programs on which the research is based span preschool through high school and range from a one-shot music-based program focused on attitudinal change related to racism, classism, homophobia, and misogyny [38] to a year-long, multimedia program on gender equity for fifth graders [39], both of which reported increased understanding and awareness of these rights-based issues. One strong study using a clustered randomized trial



to evaluate a 12-session, rights-based approach to sexuality education among predominantly Hispanic and African-American HS populations in Los Angeles found that, compared with students who received more traditional sex education, students who received the rights-based curriculum demonstrated more positive attitudes about sexual relationship rights [41,42].

As well, the research supports approaches that use literature to study LGBTQ rights and break down stereotyped beliefs using a social justice lens [17,20,22,23,25,34]. One such ethnographic study of a 10th grade literature class on oppression and diversity used field notes; audiotapes and videotapes; student surveys; writing samples; interviews with teachers, students, parents, and school personnel; and a retrospective group discussion with students 2 years post-intervention [20]. Respondents reported having myths of homosexuality dispelled, emerging empathy for gays and lesbians, and a belief in rights of gay and lesbian people to be who they are. The authors noted that establishing a safe climate in which to discuss sensitive and controversial issues was essential to the positive outcomes. Despite being an older (1996) study, it nonetheless supports the use of targeted strategies to increase acceptance and understanding of the LGBTQ community. Another study examined a high school literature class that used an “anti-oppression curriculum.” Using qualitative analysis software to analyze teacher and student interviews and questionnaires, the study reported that students moved from discomfort to confidence in discussing LGBTQ issues, gained a fuller understanding of the complexities of sexuality, and became more supportive allies and advocates of the LGBTQ community [22].

Two smaller studies are worth noting for their support of teaching about sexual rights in the context of social justice to younger children. In one, fourth- and fifth-grade students exposed to LGBTQ literature, history, and current events were successful in discussing and understanding issues of social justice and equity for LGBTQ people. They had the capacity to understand LGBTQ discrimination and lack of power and how they are related to oppression based on race, religion, culture, and other identities [37]. In a qualitative study of a preschool class that used literature to discuss marriage equality and LGBT rights, 4-year-olds expressed an inclusive understanding of marriage and a social justice stance on LGBTQ rights [25].

Finally, there is support for programs that use a gender-transformative approach to promote more equitable relationships among genders. Such programs make discussions of gender in the context of power and the promotion of gender equality and women’s empowerment, central to an intervention [43]. Studies of this approach showed reduced adherence to gender norms and gender-related power structures [41,44]. Such programs also had notable positive impacts on sexual health, personal safety, and bystander intentions [41,42,45,46]. Finally, although the current literature review is not focused on disease and pregnancy prevention programs, it is important to note that a focus on gender and power has the potential to influence a broad array of important sexual health outcomes. A meta-analysis that reviewed 22 sexuality and HIV curricula, across multiple age groups, found that programs addressing gender and power in relationships were five times more likely to be effective in reducing STI and pregnancy rates than those that did not address these topics. Specifically, 80% of such curricula versus 12% of curricula that did not address these topics were associated with lower STI and pregnancy rates [46].

### *Dating and intimate partner violence prevention*

Strong evaluations demonstrate a range of positive outcomes for programs that focus on prevention of dating violence (DV) and intimate partner violence (IPV) among both middle school and high school youth. The terms DV and IPV are used interchangeably in some studies, while others, particularly those that are earlier, tend to use only the term DV.) School-based efforts have the potential to play an important role in reducing DV and, in many cases, have shown positive long-term outcomes [47,48]. Outside of pregnancy and disease prevention, this has been the most extensively evaluated aspect of school-based sex education efforts. There is strong evidence that programs can increase knowledge, change attitudes, and improve skills to reduce DV and IPV and can actually reduce the incidence of both DV and IPV.

The most promising approaches to addressing DV and IPV for school-aged youth have focused on social justice [49,50], shifting norms around DV [47,51] and/or gender roles [52], and conflict management skills [47,50]. Programs in this category have used a variety of educational methods, including instruction that supports social-emotional learning (SEL) [50,53], role-plays [49], multiple sessions and/or grade levels [47,53–55], theater [47], peer education [50], and enhanced building-level interventions [56], and have focused on sexual coercion, such as pressure, date rape, and exploitation [57,100].

*Improved knowledge and attitudes about, and reporting of, DV and IPV.* There is extensive evidence that school-based programs have resulted in improved knowledge and attitudes related to DV and IPV, including reduction in rape myths, victim blaming, and sexist attitudes [56,58–62], and increased knowledge and attitudes about IPV [50–52,58,62–66]. Strong evaluations have demonstrated improved communication skills and handling feelings of anger [49,51], increased awareness of laws and victim services [49,51,67], and reduced acceptance of sexual coercion [57]. Programs have resulted in increased intentions to reduce coercion [68] and have demonstrated increased self-efficacy [68] and adherence to social norms [69] to reject sexual harassment. In one study, significant change in HS students’ attitudes about DV at post-test and follow-up was greater for students who had reported higher school connectedness at pretest [70]. This finding suggests that efforts to help connect youth to school more generally may have the potential to influence longer term outcomes beyond school performance.

*Decreased DV and IPV perpetration and victimization.* Several large, rigorous studies are notable for strong behavioral outcomes in the area of DV and IPV prevention. These include a randomized evaluation of *The Fourth R* [50], a meta-analysis of 23 DV and IPV program evaluations in Grades 4 to 12 [58], a review of multiple studies on five different 6th- to 12th-grade programs [63] and a randomized, longitudinal study of *Safe Dates* [49,51]. These and other school-based programs have led to reductions in DV and IPV perpetration [48,49,52,63,71], victimization [44,48,54,56,58,71,72], emotional violence perpetration [47,60], verbal aggression [66], and referrals for harassment [73]. Some outcomes were found to have persisted for up to 4 years post-intervention [48,54,71].

Notably, several programs that took place in the eighth grade or earlier showed important long-term outcomes. The *Fourth R: Skills for Youth Relationships*, initially developed for ninth graders, stands out for its sequential version in Grades 7 and 8,

demonstrating decreases in both physical and emotional DV among boys at ninth-grade follow-up [71]. *Safe Dates*, in the eighth grade, with evaluation differentiating a range of violence-related outcomes, demonstrated reduction of sexual violence perpetration at immediate post-test [49], as well as reduced perpetration and victimization of physical violence at the 4-year follow-up. Compared with controls, treatment schools reported 25% less psychological abuse perpetration, 60% less sexual violence perpetration, and 60% less physical violence perpetration with a current dating partner [48].

*Increased bystander intentions and behaviors.* Research on school-based bystander intervention programs has demonstrated increases in reported positive bystander behaviors [45,52]. As well, several studies have demonstrated increases in bystander self-efficacy [61], skills [52], and intentions [29,45]. A systematic review of 7th- to 12th-grade bystander intervention programs suggests beneficial effects on bystander behaviors up to 4 months following the programs [74]. An IPV prevention program in an alternative HS showed strong improvements in bystander skills, gender-equitable attitudes, and bystander interventions, leading to improved overall school climate and improvement in the external reputation of the school [52]. A strong randomized study of a coach-led intervention in 16 high schools increased intentions to intervene, improved gender-equitable attitudes, and improved bystander actions among male athletes, both at post-test and 1-year follow-up [45,75].

#### Healthy Relationships

Programs specifically designed to reduce dating and interpersonal violence often had broader healthy relationship concepts among their measured outcomes. This section, however, reviews healthy relationship outcomes outside the specific context of DV or IPV prevention programs. These efforts focused on healthy relationships as a foundation for adolescent sexual health [54] and emphasized communication skills [47,55,76,77], ethics and social justice [29,41,77,78], and social-emotional learning [73,76].

*Increased knowledge, attitudes, and skills.* Two important studies demonstrated improvements in knowledge and attitudes related to healthy relationships. In a one-group, repeated-measures design with 3,658 ninth graders, the *Relationship Smarts* curriculum demonstrated significant improvements in healthy relationship knowledge and dating skills, as well as improved relationship skills for parent-adolescent relationships, both at post-test and 1-year follow-up [55]. Notably, knowledge about healthy relationships at baseline predicted improvements in parent-adolescent relationship scores at post-test, suggesting that knowledge in one relationship context has the potential to translate to other types of relationships. In addition, a peer-facilitated, five-session healthy relationship program for academically at-risk adolescents, adapted for cultural relevance in three metropolitan areas of Southeastern U.S., demonstrated strong improvements among ninth graders on knowledge and attitudes about healthy relationships [65].

*Improved communication skills and intentions.* Curricula that addressed communication within relationships resulted in improved communication skills and intentions, including increased intentions to discuss relationships and/or sex within

relationships [53,55,76,78], and with parents and medical providers [79]. A longitudinal study of 1,600 Mexican fourth graders, in the *Yo Quiero Yo Puede* program, which focused on the importance of talking about taboo and difficult subjects, demonstrated improved communication skills in these subjects and increased self-efficacy and intentions to discuss difficult subjects, including romance, sexuality, and threatening or unpleasant topics [76]. Rigorous evaluations found significant increases in communication skills for both the *Respectful Relationships* 6th to 10th grade sequential curriculum [77], and the *Fourth R*, for ninth graders [53].

#### Child sex abuse prevention

This review found strong evidence for the effectiveness of child sex abuse prevention efforts in elementary school. Such programs typically use behavioral practice and role-play [80] and encourage parental involvement [81,82]. They teach about body ownership and children's right to control their bodies [82] and about communication and self-protection [81,82]. A strong meta-analysis of 27 preschool through Grade 5 programs [80] and a systematic review of 24 K-5 programs [83] demonstrate significant effects on a wide range of outcomes, including behaviors in simulated at-risk situations. Another large systematic review concluded that, in general, parental involvement, opportunities for practice, repeated exposure, and sensitivity to developmental level were key characteristics of effective child sex abuse programs [81].

*Improved knowledge, attitudes, skills and social-emotional outcomes related to personal safety and touch.* A systematic review of 22 North American and UK curricula for K-6 children found significant increases in knowledge across programs, improved self-protective skills, particularly among older elementary students, and emotional gains in self-esteem, self-efficacy, and feelings of safety, in approximately one third of the programs. Gains in knowledge and some social-emotional outcomes remained at 3- to 5-month follow-up [84]. In a rigorous cluster randomized study of six New York City elementary schools, *Safe Touches* for second and third graders showed significant improvement in knowledge of safe touch [85]. Notably, intervention-control group differences were larger when "stranger danger" items were removed, suggesting that this curriculum was able to address inappropriate touch in a more nuanced way. *Stay Safe* primary prevention, for 7- and 10-year-olds in Ireland, demonstrated gains in knowledge, skills, and self-esteem, maintained at 3-month follow-up. Notably, gains were greatest for the younger students [82].

Child abuse prevention programs for second to fourth graders demonstrated significant increases in knowledge of appropriate and inappropriate touch, what to do in an inappropriate situation [86], and increased knowledge and skill to identify unsafe situations [87]. A strong randomized study in 21 urban U.S. schools found gains were maintained at 1 year, with no increase in anxiety, concluding that it is safe to discuss sensitive subjects with young children, and demonstrating the value of early education [87]. A kindergarten program showed significant improvement in knowledge of unsafe secrets and distinguishing between tattling and reporting [88], and another program conducted with 123 Latinx preschoolers demonstrated increased knowledge and skills at post-test and 3-month follow-up [89]. Studies in the U.S. and Canada [81] reported positive effects on

sense of control and safety felt by children, including, in one, more positive feelings about their genitals (e.g., it's okay to touch one's own private parts).

*Improved disclosure skills and behaviors.* Several studies have demonstrated improvements in young children's skills and behaviors specifically related to disclosure [80–82,90,91]. Evaluation of an early elementary sexual abuse prevention program in China focused on “no, go, and tell,” using random assignment by classroom to intervention and non-intervention groups, found significant increases for important skills related to reporting [90]. Fifth graders in *Child Sexual Abuse Prevention Education* in South Korea [91] showed significant improvement in self-protective behaviors. A systematic review of childhood sex abuse curricula in the U.S. and Canada concluded that one of the most common effects was increased knowledge of a resource person to whom children would report abuse [81]. More important, behavioral outcomes included increased parent–child communication about child sex abuse, and when implemented with a group of children known to have been abused, increased disclosure.

#### *Additional outcomes*

*Social–emotional learning.* Although not identified as a goal of sex education per se, the incorporation of social-emotional learning into sex education has been explored in the literature [101]. Studies identified here demonstrate a range of important social–emotional outcomes, across grade levels, resulting from sex education in the classroom, including increased empathy [19,20], respect for others [26], improved communication [41,51,76,77,81], managing feelings [49], positive self-image (including body image) [82,84,92–96], increased sense of self-control and safety [81], and establishing and maintaining positive relationships [55]. For example, evaluation of *Respectful Relationships*, a sequential, 4-year social justice program in Canada, with 1,748 6th to 10th graders, demonstrated significant growth in empathy, self-esteem, ability to speak one's opinion, belief in equal rights for all, and “seeing people for who they are on the inside.” In addition, the program demonstrated increased nonviolent conflict resolution among girls, and among boys, increased discomfort in seeing others being picked on [77].

*Media literacy.* Similarly, media literacy is not commonly included in discussions about sex education outcomes, although it is recognized as an important life skill for young people. Two studies reviewed here, however, suggest that media literacy may be particularly important as an outcome within sex education. Two eighth grade programs using a media literacy approach [79,96] demonstrated increased media deconstruction skills, understanding of how media affects both sense of self and perceptions of teen norms, and, most notably, intentions for communication with parents, partners, and medical providers about sex.

#### **Discussion**

The purpose of this review was to understand whether achieving certain CSE goals is possible. The SLR aimed to triangulate findings from a wide range of peer-reviewed studies to identify evidence that supports educational approaches to improving adolescent sexual health and provides theoretical

guidance for the broad goals of CSE. As such, we did not seek to identify or recommend specific programs or educational methodologies. Different settings, cultures, and local practices will dictate what specific approaches will ultimately be most effective and appropriate.

There is ample evidence that the physical and emotional health of young people is related to their academic achievement, as healthier students are more likely to stay in school and achieve higher grades, whereas health-related problems may contribute to academic struggles including higher absenteeism and dropping out [102–107]. Evidence reviewed here highlights this point with respect to sexual health. That is, if students are able to avoid early pregnancy, STIs, sexual abuse, and interpersonal violence and harassment, while feeling safe and supported within their school environment, they are more likely to experience academic success, a foundation for future stability.

This systematic review of the literature on sexual health outcomes from the past 30 years, provides encouraging documentation for the field of CSE. By setting aside studies looking strictly at pregnancy and STI prevention efforts, we were able to put a spotlight on critical CSE goals that often get lost in discussions about the impact of sex education on adolescent health. The findings reported here highlight important topics and approaches that show evidence of success, as well as areas of CSE that remain understudied. What this review found is that school-based CSE can lower homophobia and homophobic-related bullying, can increase understanding of gender and gender norms, can improve knowledge and skills that support healthy relationships, can build child sex abuse prevention skills, and can reduce dating and intimate partner violence.

#### *Support for early, scaffolded, and multigrade approaches*

This review offers substantial evidence that sexuality education is most effective when begun early and before sexual activity begins [76,80,82,83,92,93,108–110]. As well, several studies, including some strong systematic reviews and meta-analyses, provide ample support for teaching that builds on previous lessons and/or grades and for programs of longer duration [25,34–37,39–41,47,50,74,77,81,111,112]. As with all other areas of the curriculum, building an early foundation and scaffolding learning with developmentally appropriate content and teaching are key to long-term development of knowledge, attitudes, and skills that support healthy sexuality.

CSE is designed to include all grade levels, K-12, and in the early grades, even in preschool, there seems to be little controversy or discomfort around discussions in the context of child sex abuse prevention. The literature on sexual abuse prevention efforts in early grades reviewed here shows strong evidence that young children can develop self-protective knowledge, skills, and intentions, including an increased likelihood of reporting sexual abuse and knowing how to respond in a dangerous situation, all without increasing anxiety. Other than in this area, though, there are only limited examples of sexuality-related content in the K-5 curriculum [113], many topics being deemed traumatizing, inappropriate, or premature for young children and thus remaining controversial [114,115]. The data, however, strongly indicate that such topics are developmentally appropriate and produce positive outcomes, while providing a foundation for future learning. This review suggests that not only are younger children able to discuss sexuality-related issues but that the early grades may, in fact, be the best time to introduce topics related to

sexual orientation, gender identity and expression, gender equality, and social justice related to the LGBTQ community before hetero- and cisnormative values and assumptions become more deeply ingrained and less mutable. Children learn gender role attitudes at an early age from observing the people in their families [116]. As they progress through school, these attitudes are further shaped by classmates and peers, as well as by the biases of teachers, the design of the curriculum, and the school environment [117,118]. Given the influence of this early socialization and learning, it is important to introduce concepts that would disrupt stereotypical and harmful biases related to gender and sexual orientation, during this formative time.

#### *Tackling homophobia, transphobia, and hostile school environments*

Particularly at-risk, LGBTQ students continue to face a hostile environment in school, routinely hearing anti-LGBTQ language and experiencing victimization and discrimination at school [119]. These students have “worse educational outcomes and poorer psychological well-being,” experiencing lower self-esteem and higher rates of depression [119]. Efforts to reduce homophobic bullying and harassment and to increase appreciation for sexual diversity can improve the school climate for all students, and, as this review found, create a safer environment that is more conducive to learning, and to better mental health for sexual minority students. Evidence of success was found from individual classroom efforts, as well as from inclusivity across the curriculum, in promoting a more accepting and welcoming environment for sexual minority youth.

#### *Social justice pedagogy*

The literature highlights both the efficacy and importance of addressing gender and sexual orientation within the context of human rights and equality [120–124]. Helping young people to challenge the social structures and systems that lead to discrimination and oppression based on gender and sexual orientation is critical to their sexual, emotional, and social development. The evidence reviewed here suggests that expanding social justice pedagogy within the sex education curriculum beyond the topics of gender and sexual orientation makes sense as well, and that research on such efforts is much needed.

#### *Importance of social-emotional learning*

SEL has been found to improve academic outcomes and behaviors that confer real-life benefits among students from kindergarten through high school including improved classroom behavior, increased ability to manage challenging emotions, and better attitudes about themselves, others, and school [125–127]. The findings from this review suggest that CSE represents a critical component of SEL and outcomes. Given that, it is essential that core SEL competencies be proactively integrated into school-based sex education efforts [128], and measured in any assessments.

#### *Sex education across the curriculum*

It is worth noting that in this review, many of the positive outcomes and promising approaches that worked toward

creating affirming, inclusive school environments occurred not in traditional health or sex education classes, but in social studies, English, physical education, mathematics, music, and art. In particular, the vast majority of successful approaches to LGBTQ and gender norm topics in the elementary school grades used literature with students as the entry point for learning and discussion, most with the goal of increasing appreciation and acceptance of sexual and gender diversity [17,25,34–37]. The fact that topics falling within sex education can be addressed successfully across the curriculum is encouraging and offers much needed flexibility to schools, both in terms of available time and talented teachers to tackle difficult and important topics. It also provides an opportunity to explore sexuality-related issues in different contexts and by applying a variety of lenses. Given that most schools have limited time allotted to health or sex education [129], a coordinated and concerted effort to teach and reinforce important sexual health concepts throughout other areas of the curriculum is a promising strategy.

#### *Unmet needs*

Several areas of focus are notably absent from the evaluation literature. Two topics often excluded from curricula, and therefore not included in outcome evaluations, are pleasure and desire [130,131]; most sex education is focused on sex as a problem behavior. The literature suggests that there is a need for, but little evidence of, teaching that views teen sex as normative, rather than pathological [132–134]. Furthermore, a few studies have concluded that it is not sexual behavior, per se, but the lack of a relationship context when it occurs, that is predictive of poor school outcomes [135,136]. Yet, the focus on sexual behavior as problematic itself eliminates the opportunity for young people to explore and experience normal, healthy, safe, and pleasurable sexual activity.

It is important to note that much of the dating violence and IPV prevention literature focuses on programs that are traditionally gendered, that is, most do not address IPV specific to sexual minority youth. As schools begin to demonstrate greater acknowledgment of nonbinary gender identities, hopefully this change will be reflected in future research. Some studies have demonstrated that mixed gender interventions have stronger outcomes than interventions conducted in single-gender groups [57,137]. Thus, more research on programs with expansive gender paradigms is needed, given that single-gender and gender-binary interventions have the potential to further victimize gender-nonconforming, nonbinary youth.

Two studies specifically noted that children with disabilities were excluded from analyses [84] or that outcomes were weaker for schools that had a higher proportion of classified students [85]. Although there has been increasing focus on this diverse population, with curricula and guidance for teaching young people with disabilities [138], there is limited literature that has attempted to evaluate the effectiveness of such approaches. Yet, young people with intellectual or physical disabilities may be at greater risk for poor sexual health including sexual abuse and exploitation, pregnancy and STIs, and difficulty forging and maintaining healthy relationships [139–141]. The findings of this review suggest a strong need for evaluations focused on sex education efforts with these learners.

The updated NSES [13] stress that sex education must be taught within the larger context of intersectionality, that is, the fact that young people cross a variety of sexual orientation,

gender identity, racial, ethnic/cultural, and other groups. Sex education researchers have also raised this important point [120–124]. The only educational approaches reviewed here that specifically addressed intersectionality [19,20,37,38] were those with an explicit social justice aim. To realize the full potential of CSE, considerations of race, class, culture, ability, SES, and other important characteristics need to be more deliberately woven into curricula, teaching, and evaluation. Further, this review suggests the need for a broader social justice approach within sex education – one that examines sexual orientation and gender together with race, culture, and other identities, in the context of systemic oppression and its impact on marginalized communities. This approach is consistent with the guidance offered by the updated NSES and suggests that additional research on the outcomes of such efforts is much needed.

### Limitations

Despite a systematic approach, this review is not exhaustive and may not have yielded the full range of evidence. Because the search focused on keywords and databases that reflect the peer-reviewed sex education and sexual health literature, some of the research published outside of this literature may not have been fully represented. In addition, the inclusion only of English-language papers limited our ability to assess all the existing literature on this topic. Thus, it is likely that some effective approaches were not included. As well, most of the studies on sexual orientation and related outcomes focus on LGB concepts as a summary term, but reports of reduced homophobia, for example, may not have specifically measured reduction in “biphobia.” This lack of clarity may reduce the ability to generalize outcomes reported here to include bisexuality.

It is also of note that the vast majority of studies identifying positive outcomes related to puberty, and anatomy and physiology, tend to be within the context of pregnancy and disease prevention programs. Thus, they are not reviewed in this article.

Finally, the initial search was based on the language of the NSES First Edition [12]; thus some important terms may have been underrepresented in the results. For example, one of the strongest findings was related to the use of a social justice framework to teach about sexuality. Had the NSES Second Edition [13], which address this issue more thoroughly, been used in the original search, it is possible there would have been even more evidence in this area. Nevertheless, this review provides extensive support for a broad and comprehensive treatment of sex education and the effectiveness of such an approach.

### Support for comprehensive sex education

A review of the literature of the past three decades offers strong support for comprehensive sex education. The findings provide evidence for the effectiveness of approaches that address a broad definition of sexual health and well-being and take positive, affirming, and inclusive approaches to human sexuality, across multiple grade levels. Notably, they reinforce the guidance to public schools provided by the *National Sex Education Standards* and further strengthen the justification for their widespread adoption.

The implications of this work for school communities are important. In short, attention to the full range of sexual health topics, scaffolded across grades, embedded in supportive school environments and across subject areas, has the potential to

improve sexual, social, and emotional health, and academic outcomes for young people.

### Acknowledgments

The authors acknowledge, with great thanks: The Grove Foundation, which funded this project; FoSE (the Future of Sex Education), for guidance and vision in the scope of this work; Alejandra Kaplan, M.P.H.; Jacqueline Bavaro, M.P.H.; Emma Ophof, M.P.H.; Natalie Strucinski, M.P.H.; Katharine Mauro, M.P.H. and Rachel Wilkins, M.P.H. candidate, for their tireless work on this project.

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