Re-Examining the Evidence for School-Based Comprehensive Sex Education: A Global Research Review

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ABSTRACT

Purpose. To evaluate the global research on school-based comprehensive sex education (CSE) by applying rigorous and meaningful criteria to outcomes of credible studies in order to identify evidence of real program effectiveness.

Methods. The Researchers examined 120 studies of school-based sex education contained in the reviews of research sponsored by three authoritative agencies: the United Nations Educational, Scientific and Cultural Organization, the U.S. federal Teen Pregnancy Prevention Program, and the Centers for Disease Control and Prevention. Their reviews screened more than 600 studies and accepted only those that reached a threshold of adequate scientific rigor. These included 60 U.S. studies and 43 non-U.S. studies of school-based CSE plus 17 U.S. studies of school-based abstinence education (AE). The Researchers evaluated these studies for evidence of effectiveness using criteria grounded in the science of prevention research: sustained positive impact (at least 12 months post-program), on a key protective indicator (abstinence, condom use—especially consistent use, pregnancy, or STDs), for the main (targeted) teenage population, and without negative/harmful program effects.

Results. Worldwide, six out of 103 school-based CSE studies (U.S. and non-U.S. combined) showed main effects on a key protective indicator, sustained at least 12 months post-program, excluding programs that also had negative effects. Sixteen studies found harmful CSE impacts. Looking just at the U.S., of the 60 school-based CSE studies, three found sustained main effects on a key protective indicator (excluding programs with negative effects) and seven studies found harmful impact. For the 17 AE studies in the U.S., seven showed sustained protective main effects and one study showed harmful effects.

Conclusions. Some of the strongest, most current school-based CSE studies worldwide show very little evidence of real program effectiveness. In the U.S., the evidence, though limited, appeared somewhat better for abstinence education.

Key Words: Sex Education, Sex Education Effectiveness, Comprehensive Sex Education, Teenage Pregnancy, Abstinence Education

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Introduction

The short- and long-term consequences of teenage sexual activity continue to cause significant health and social problems in cultures and countries around the world, in spite of more than 30 years of prevention efforts. Worldwide, the AIDS epidemic continues, with "young people aged 15–24 accounting for 45% of all new HIV infections."[1] In the United States, sexually transmitted diseases (STDs) have been called a hidden epidemic, one that hits young people the hardest. The Centers for Disease Control and Prevention (CDC) reports that "1 in 4 sexually active adolescent females has an STD," and STD rates for adolescents are rising.[2] (Note: we use the term STDs rather than STIs, or, sexually transmitted infections, to be consistent with the CDC's terminology as well as common popular usage.) Teenage sexual activity contributes to decreased mental/emotional health (e.g., higher risk of depression and suicide) and greater likelihood of dating violence, especially for females and younger teens.[3-8] And teen pregnancy occurs at elevated rates in minority populations, with the children of teenage mothers—born and raised without a father in the home—more likely to drop out of high school, live in poverty, engage in illegal behavior, and/or become teen parents themselves.[9, 10, 11]

Given these harms, many public policymakers place a high priority on 1) reducing teen pregnancies, 2) reducing STD and HIV infections among adolescents, and 3) influencing youth to abstain from sexual activity. The wholesale delivery of "clear, well informed, and scientifically-grounded sexuality education" to youth populations worldwide is seen by many as an essential mechanism for achieving these goals.[1] One type of sex education strategy promoted widely as a solution is known as "comprehensive sex/sexuality education," or CSE. The main focus of CSE programs typically is to promote

condom and contraceptive use and other "safer sex" behaviors for sexually active youth. CSE programs also typically purport to contain an abstinence message—that teens can choose to delay or abstain from sexual intercourse until they are older or decide they are ready to have sex—but the amount of emphasis given to this can vary widely from program to program.

A sex education strategy often mentioned as an alternative to CSE is "abstinence education" (AE), sometimes also referred to as "abstinence-only" or "sexual risk avoidance" programs. The AE approach typically teaches youth to abstain from overtly sexual behavior with another person (including vaginal intercourse, oral and anal sex, mutual masturbation, and heavy petting) until they can form a mutually monogamous relationship in adulthood (often defined as marriage), in order to eliminate risk (rather than merely reduce it) and avoid the negative consequences of teen sex. Condom use is sometimes addressed in AE, but often in terms of its limitations or failure rates. (For the purposes of this review, only programs that teach abstinence as the primary protective message and do not promote or demonstrate condom or contraceptive use were labeled as AE.)

The justifying rationale for CSE and its supposed advantage over AE has been that it is best suited to protect the full spectrum of youth from unwanted pregnancy and STDs through its purported dual benefit: that it can simultaneously increase rates of both teen abstinence *and* condom use (by teens who reject abstinence) all within the same population and program.

However, CSE programs are often founded on a "values-free" sexual philosophy containing permissive and explicit content that can be of concern to parents and is considered morally unacceptable to some, especially in more-traditional cultures around the world. Yet, because such programs have been declared to be effective by preeminent public health agencies and organizations that advocate for youth, they are often presented as a necessary solution—the best solution—to the damaging consequences of teenage sex. For example, one prominent advocacy organization states that CSE "has been proven effective" and that "young people need comprehensive sex education."[12] Such assertions of CSE effectiveness are buttressed by some authoritative agencies that report there is good scientific evidence for CSE. For example, the sex education guidance document produced by the United Nations Educational, Scientific and Cultural Organization (UNESCO) declares, "Programmes that combine a focus on delaying sexual activity with content about condom or contraceptive use [i.e., CSE] are effective," and recommends implementing CSE programs in school classrooms worldwide as "part of the formal school curriculum," that is, to "bring CSE to children and young people everywhere. [1,13]

Given this focus on the school setting as a key venue for the worldwide delivery of CSE, the question of CSE effectiveness in school classrooms is crucial to both the protection of young people and the prudent stewardship of public funds, on a global scale. However, the definitions of effectiveness employed by many research reviews to

evaluate CSE program outcomes have been notably weak, raising serious questions about the claimed extent of CSE success. Such concerns and the gravity of their consequences were the impetus for our examination of the best available sex education outcome research, with the purpose of addressing the critical question: just how effective are CSE programs in schools?

Methods

Defining Program Effectiveness

We have examined reviews of sex education research conducted by key organizations in this field and have observed an important but little-reported characteristic common to many of them. While most of these organizations set a reasonable standard for the quality of the *scientific methods* employed by the studies included in their review, they often apply much more lenient standards to the quality of program *outcomes* used to define effectiveness. Their claims of CSE program effectiveness are typically based on a fairly low benchmark for these outcomes, often the finding of only one minimal indicator of positive impact. This could be a short-term effect (e.g., found after three months that disappears 12 months after the program) or a subgroup effect (e.g., impact for girls but not boys) or impact on a less-protective behavior (e.g., reduced frequency of sex) while no effects are found for key protective behaviors (increased abstinence or condom use, reduced pregnancy or STDs). Often this minimal evidence comes from just one study by the program's developers (not an independent evaluator). And too often other evidence of program ineffectiveness or even harm is ignored. Such a definition suggests a different meaning for the term *effective* than what people may typically think of when they hear that a CSE program has "shown evidence of effectiveness."

One example of this is the U.S. federal Teen Pregnancy Prevention (TPP) initiative established by the Department of Health and Human Services in 2009 to identify evidence-based sex education programs. It designated a program as having shown "evidence of effectiveness in reducing teen pregnancy, sexually transmitted infections, and associated sexual risk behaviors" by virtue of producing only one statistically significant positive effect, even if only of short duration or only for a subgroup of the target population or found in a single study by the program's developer, and regardless of other contradictory findings.[14] (For the school-based CSE programs on the TPP list, 80% of the original qualifying studies were by program developers. Yet, some research shows that studies by program developers tend to find stronger program effects than studies conducted by independent evaluators.[15]) Two school-based CSE programs on the TPP register, "¡Cuídate!" and "It's Your Game: Keep It Real," illustrate TPP's criteria for "evidence of effectiveness." They were each found to have no positive effects and to increase multiple risk behaviors in several studies (most by independent evaluators).[16-19] Yet as of this writing the programs are listed as showing evidence of effectiveness because some positive effects were reported in studies by the programs' developers.[20-22]

The present review used a different approach. Program results were evaluated according to criteria for program effectiveness derived from the field of prevention research. Assuming that adequate standards of *methodological* rigor have been met (to give confidence in the study findings), the scientific consensus, as reflected in the work of organizations like the Society for Prevention Research and Blueprints for Healthy Youth Development, recommends defining program effectiveness using rigorous standards for program outcomes.[23, 24, 25] We applied these recommendations in ways relevant to sex education in school settings:

1. We looked for positive program effects (significant at the $p<.05$ level)...
   a. On at least one key protective indicator: delay of sexual initiation/debut, increased condom use—especially consistent condom use (the behavior necessary for maximizing the partial protection condoms can provide from STDs[26]), or decreased pregnancy or STDs rates;
   b. Sustained at least 12 months after the end of the program (thus lasting from one school year to the next);
   c. Found for the main (targeted) population of program recipients, not just a subgroup;
   d. Based on the pattern of evidence from all credible studies of the program, including studies by independent evaluators (i.e., those not program developers or marketers).
2. Negative/harmful program effects on important sexual health indicators for the intended population or a substantial subgroup (e.g., males only or females only) that lasted for any duration were considered to negate a prevention program's claim to "effectiveness," consistent with guidelines from the field of prevention program research.[23, 24, 25]

(A note about consistent condom use (CCU): Using a condom with every act of sex is required for meaningful risk reduction. According to the CDC, "To achieve the maximum protective effect, condoms must be used both *consistently and correctly.* Inconsistent use can lead to STD acquisition because transmission can occur with a single act of intercourse with an infected partner." [26] This is illustrated by a study of African American teenage girls that found 17.8% of those who used condoms consistently acquired an STD, but the number was 30% for those who used condoms less than consistently.[27] At least three studies have found STD rates were higher for inconsistent condom users than non-users. [28, 29, 30] However, most CSE studies do not measure CCU but instead assess less-protective indicators—frequency of condom use or use at last intercourse. Where CCU and less-protective indicators were both measured in the same study, we considered CCU the key indicator, with failure on this outcome *not* outweighed by success on a less-protective measure of condom use. Where CCU was not measured, we accepted a less-protective measure of condom use as a surrogate indicator of effectiveness.)

Applying these more-credible standards of effectiveness identifies evidence of school-based CSE effectiveness that has both scientific validity and practical utility for policymakers.

The Database

Hundreds of studies of sex education program effectiveness have been conducted in the U.S. and worldwide since such programs became common in the early 1990s. This universe of studies has been reviewed by many scientific entities, which have then summarized the results of the studies that met their standards for acceptable research quality. Among such entities are three authoritative agencies: the Teen Pregnancy Prevention program (TPP) in the U.S. Department of Health and Human Services (HHS),[14, 31-34] the Community Preventive Services Task Force supported by the U.S. Centers for Disease Control & Prevention (CDC),[35-37] and the United Nations Educational, Scientific and Cultural Organization (UNESCO).[1, 13] Each of these entities has identified and reviewed the credible sex education studies conducted since 1990, running through 2008 for the CDC and through 2018 for TPP and UNESCO. (The two U.S. agencies reviewed only U.S. studies, while UNESCO reviewed studies in both U.S. and non-U.S. settings.) The TPP review produced a list of CSE programs that it declares "have shown evidence of effectiveness" while the other two reviews concluded that CSE has shown sufficient evidence of effectiveness to recommend it as a prevention strategy in schools and other settings.

Because the studies included in these three databases met the standards for adequate research quality established by these preeminent agencies, and because our focus was programs in school settings, we combined the studies of *school-based* sex education contained in each of these three reviews to form the database for our analysis (there was a considerable overlap of studies contained in more than one of the three reviews). This allowed us to examine what other experts have identified as some of the best evidence for school-based CSE effectiveness. (We designated a sex education program as "school-based" if it occurred in a school classroom during the normal school day, or recruited its subjects from the school and occurred after school or at the school on Saturdays, and the majority of the intervention was not community-based.)

Combining these three reviews yielded 103 studies of 79 CSE programs in schools around the world: 60 studies of 40 programs in the U.S. and 43 studies of 39 programs in other countries (40 of the non-U.S. studies were in "low- or middle-income" countries, including 29 in Africa). In addition, there were 17 U.S. studies of 16 school-based abstinence education programs (AE) contained in the same database, studies that had met the same standards of research quality. (The international data did not contain enough studies of true abstinence-only programs for this review.) This provided a total of 120 studies for our analysis. We examined each study, rather than relying on summaries by other reviewers, and evaluated the program's outcomes according to the criteria outlined above. Our results are summarized in Tables 1 – 4 below and shown study by study in the Appendix (Tables 5 – 7).

Results

Findings for U.S. School-Based Comprehensive Sex Education

For the 60 studies of 40 school-based CSE programs in the U.S., three studies of three programs found positive impact at least 12 months after the program on a key protective outcome for the intended/targeted population without other negative effects.[38-40] None of the three studies was conducted by an independent evaluator (i.e., not the program developer or marketer), and replication studies have not confirmed the initial positive results. The three studies finding effectiveness constituted 15% of the 20 programs that measured this more-rigorous definition of effectiveness. Inversely, 85% of the U.S. school-based CSE programs that measured effectiveness failed to find it. And seven studies of six school-based CSE programs found 10 harmful impacts: increased sexual risk or reduced sexual health.[16-18, 33, 41-44]

Findings for U.S. School-Based Abstinence Education

The 17 studies of 16 school-based abstinence education programs in the U.S. found that seven AE programs delayed sexual initiation (increased abstinence) at least 12 months after the program for the target population, without other negative effects.[45-51] (One of these was the first year of a three-year program that was CSE for the second and third years but was abstinence education for the first year.[52]) Five of these seven studies were by independent evaluators.[46, 48-51] Replication evidence is not yet available for most of these positive results. The nine studies that measured condom use found no detrimental effects.[53-60] One AE program showed a negative program effect: an increase in number of sex partners.[17, 22] And 53% of the AE programs that measured effectiveness, as defined above, failed to show it.

Findings for International School-Based Comprehensive Sex Education

Of the 43 studies that evaluated 39 school-based CSE programs outside the United States, three programs produced positive impact 12 months after the program, on a key protective outcome (abstinence, CCU/condom use, pregnancy, or STDs), for the intended population, without other negative effects.[61-63] One of the three studies was by an independent evaluator, and none of the results have been replicated.[61] Nine international studies found 12 harmful CSE effects on school populations.[64-72] Failure to show effectiveness was 89% for school-based CSE in international settings.

Global Findings for School-Based CSE (U.S. and non-U.S combined)

Of the 79 U.S. and international school-based CSE programs evaluated by 103 studies, six studies of six programs found sustained post-program impact on one of the key protective outcomes, for the targeted population, without other negative effects.[38-40, 61-63] One of the six studies was by an independent evaluator.[61] There was no effectiveness at increasing consistent condom use or at achieving the purported dual benefit of CSE—increasing both abstinence and condom use (by the sexually active). Sixteen studies

of 15 programs found 22 negative CSE effects: increased sexual risk behavior, STDs, or pregnancy.[16-18, 33, 41-44, 64-72] The failure rate for school-based CSE globally was 87%.

Comparative Findings by Geographic Region and Program Type

The amount of evidence of school-based CSE effectiveness was similar and very small for programs in both U.S. and non-U.S. settings (three studies each), while the evidence for school-based AE in the U.S. appeared somewhat larger (seven studies). School-based CSE appeared to have a higher rate of negative impact outside the U.S. than within the U.S. (21% vs. 12%), and an even higher rate of harm in Africa (24%). For school-based sex education in the U.S., the rate of failure for AE appeared substantially lower (53% vs. 85%) and the rate of negative impact appeared somewhat lower (6% vs. 12%) than the rates for CSE. Five of the seven U.S. AE studies that found effectiveness were "independent," compared to none of the three U.S. CSE studies. For school-based CSE in both U.S. and non-U.S. settings the number of studies finding evidence of effectiveness appeared smaller than those finding harmful effects (combined, 6 versus 16), whereas AE in U.S. schools appeared to produce more evidence of effectiveness than harm (7 studies versus one). (We chose not to compare percentages or rates of effectiveness versus harm since it appeared to be a type of "apples to oranges" comparison—the rate of program success was influenced by the number of studies that actually measured at least a 12-month post-program effect whereas every study in the database had the opportunity to detect and report negative effects. For this reason we only compared the *amount* of evidence of effectiveness—number of studies—to the amount of evidence of harm so as to look at the relative patterns across program types and locations, rather than making statements about actual rates of effectiveness versus harm.)

Discussion

This review demonstrates the impact of employing credible criteria—standards grounded in the scientific field of prevention research that provide a useful real-world definition of program effectiveness—when evaluating sex education success. Applying such criteria to sex education programs worldwide produces a very different picture than the reports of success presented by other reviews of CSE research, which have looked at the same body of research but used a more-lenient definition of effectiveness for evaluating program outcomes. In light of UNESCO's goal to implement CSE in schools worldwide, we expect that the discrepancy between our finding of little school-based CSE effectiveness and the success typically reported by other reviews will be of interest to policymakers concerned with protecting children, improving public health, and using public funds wisely.

Paradoxically, the evidence cited by three reputable agencies—UNESCO,[13] CDC,[35] and HHS[14]—to support their assertions that school-based CSE programs are effective appears to undermine those claims when a meaningful definition of effectiveness is used. Out of the 103 school-based CSE studies in their combined databases, covering 30 years of research, only six found evidence of real effectiveness: protective impact on

Table 1. School-Based Sex Education: Number of Studies Finding Evidence of Effectiveness

	School-based Comprehensive Sex Education 103 Studies				Abstinence-only Education 17 Studies[a]
Effectiveness Criteria: *a protective effect for the intended population on sexual initiation, CCU/ condom use, pregnancy, or STDs, at least 12 months post-program, without other negative outcomes*	**Combined** Non-U.S. & U.S. 103 studies (79 programs)	**Non-U.S.** 43 studies (39 programs)	**Africa** (Subset of non-U.S.) 29 studies (26 programs)	**U.S.** 60 studies (40 programs)	**U.S.** 17 studies (16 programs)
Reduced Pregnancy	1	1	0	0	0
Reduced STDs	1	1	1	0	0
Increased Abstinence *(Delayed Sexual Initiation)*	2	1	1	1	7
Increased Consistent Condom Use *(CCU)*	0	0	0	0	0
Increased Condom Use Frequency or Use at Last Sex *(when CCU was not measured)*	2	0	0	2	0
Dual Benefit *(Increased Abstinence & Condom Use in the same population)*	0	0	0	0	0
Total # of Studies with Evidence of Effectiveness	**6[b]**	**3**	**2**	**3**	**7**
Independent Evidence *# of studies finding evidence of effectiveness, that were not conducted by the program's developers*	**1**	**1**	**0**	**0**	**5**

[a] Most of the Abstinence Education studies measured not only abstinence/sexual initiation but also other behavioral or biological outcomes in addition to abstinence. See Table 6 in the Appendix for details.

[b] Included are two studies that did not measure consistent condom use (CCU) but found sustained impact on less-protective measures of condom use (frequency or use at last intercourse). These were not optimum indicators of program effectiveness, however, they were counted here as possible surrogate indicators of CCU, lacking a direct measure of it.

Table 2. School-Based Sex Education: Evidence of Program Success vs. Failure

	School-Based Comprehensive Sex Education 103 Studies				Abstinence-only Education 17 Studies
Effectiveness Criteria: *a protective effect for the intended population on sexual initiation, CCU/ condom use, pregnancy, or STDs, at least 12 months post-program, without other negative outcomes*	**Combined Non-U.S. & U.S.** 103 studies (79 programs)	**Non-U.S.** 43 studies (39 programs)	**Africa (Subset of non-U.S.)** 29 studies (26 programs)	**U.S.** 60 studies (40 programs)	**U.S.** 17 studies (16 programs)
Program Success or Effectiveness[a] *# of programs finding evidence of effective-ness as a proportion of # of programs that measured effectiveness*	6[b]/47 13%	3/27 11%	2/19 11%	3/20 15%	7/15 47%
Program Failure *% of programs that measured effectiveness and did not find it*	**87%**	**89%**	**89%**	**85%**	**53%**

[a] It should be noted that estimating a rate of effectiveness/success is limited by the number of studies that actually measured at least a 12-month post-program effect, as well as the high number of studies that did not make it into the database because of poor scientific quality. So the true incidence of program success is unknown and these estimates should not be considered absolute but only as representing the evidence available in this database.

[b] Of the 6 studies, 5 were conducted by the program developers, leaving one that provided independent evidence of program effectiveness. Among these 5 studies are two that did not measure consistent condom use but instead found sustained impact on less-protective measures of condom use (*frequency* or *use at last intercourse*). These were not optimum indicators of program effectiveness, however, they were counted here as possible surrogate indicators of CCU, lacking a direct measure.

key outcomes at least 12 months after the program, for the intended population, without the program also producing other negative effects. Notably, there was no evidence of success at increasing *consistent* condom use—the behavior required for significant risk reduction from STDs, no evidence of success at the dual benefit that is the supposed hallmark of the CSE approach—increasing both teen abstinence and condom use within the same population, no success at reducing STDs, and only one study showed some

Table 3. School-Based Sex Education: Evidence of Harmful Effects

	School-Based Comprehensive Sex Education 103 Studies				Abstinence-only Education 17 Studies
Negative Effects *a worsening of sexual health or risk behaviors for the intended population or a substantial subgroup, for any duration after the program*	**Combined** Non-U.S. & U.S. 103 studies (79 programs)	**Non-U.S.** 43 studies (39 programs)	**Africa** (Subset of non-US) 29 studies (26 programs)	**U.S.** 60 studies (40 programs)	**U.S.** 17 studies (16 programs)
Increased Pregnancy	1	0	0	1	0
Increased STDs	1	1	1	0	0
Increased Sexual Activity *(Initiation/Frequent/Recent Sex)*	9	5	3	4	0
Decreased Condom Use	3	1	1	2	0
Increased Oral Sex	2	0	0	2	0
Increased #Sex Partners	3	2	2	1	1
Increase in Forced or Coerced Sex	2	2	2	0	0
Increase in Paid Sex	1	1	1	0	0
Total #Negative Effects	22	12	10	10	1
Net #of Studies and Programs with Negative Effects (for some studies or programs there was more than one harmful effect)	**16 studies** **16%**	**9 studies** **21%**	**7 studies** **24%**	**7 studies** **12%**	**1 study** **6%**
	15 programs **19%**	**9 programs** **23%**	**7 programs** **27%**	**6 programs** **15%**	**1 program** **6%**

effectiveness at reducing teen pregnancy. The fact that almost all of the evidence of school-based CSE effectiveness (five of the six studies) came from studies conducted by the programs' developers, rather than independent evaluators, should also not be overlooked.

These results echo findings reported by Juras and colleagues in their 2019 meta-analysis of the most recent round of U.S. TPP-funded replication studies (44 in all), the large majority of which (approximately 85%) were studies of CSE programs. The combined results of those 44 studies produced no statistically significant positive pro-

Table 4. School-Based Sex Education: Number of Studies Finding Effectiveness vs. Harm

	School-Based Comprehensive Sex Education 103 Studies				Abstinence-only Education 17 Studies
Effectiveness Criteria: *a protective effect for the intended population on sexual initiation, condom use, pregnancy, or STDs, at least 12 months post-program, without other negative outcomes*	**Combined** Non-U.S. & U.S. 103 studies (79 programs)	**Non-U.S.** 43 studies (39 programs)	**Africa** (Subset of non-U.S.) 29 studies (26 programs)	**U.S.** 60 studies (40 programs)	**U.S.** 17 studies (16 programs)
Effectiveness (Success) # of studies that found evidence of effectiveness as defined above	6 studies	3 studies	2 studies	3 studies	7 studies
Negative Effects (Harm) # of studies that found a worsening of sexual health or risk behavior for the intended population or a major sub-group, lasting any duration	16 studies	9 studies	7 studies	7 studies	1 study

gram effects on any of the targeted outcomes, including no significant effects on teen sexual activity/abstinence, contraceptive use, pregnancy, or STDs (regardless of duration of effect).[73]

The six school-based CSE studies in our review that found evidence of effectiveness stand in stark contrast to the 16 studies that found 22 *negative effects* on teen sexual health and risk behavior. There were 18 increases in teen sexual activity or other risk behaviors, in direct contradiction to UNESCO's assertion that CSE "does not increase sexual activity or sexual risk-taking behaviour."[13] In fact, there was a concerning *number* of harmful effects on program participants (22), and a concerning *prevalence* of harmful impact: 16% of studies (16 out of 103, nearly 1 in 6) or 19% of school-based CSE programs (15 out of 79, nearly 1 in 5). Thus, CSE programs in school classrooms worldwide appear to have produced more evidence of harm (16 studies) than of effectiveness (six studies). And the rate of harm was especially high for school-based CSE programs in Africa (24%, nearly 1 in 4), the continent most impacted by HIV and AIDS.

This concerning number of increases in risk behavior (18 across 79 programs) raises the question of the possible influence of "risk compensation," a phenomenon in which the perception of condoms as being highly effective would lead to increased risk behavior. Evidence for this has recently been documented in international school populations.[74]

Perhaps of equal importance, the credible scientific evidence reported here contradicts the oft-repeated claims that research shows abstinence education (AE) is ineffective and/or harmful.[13, 75, 76, 77] Seven studies judged to be of adequate scientific rigor by either UNESCO, the CDC, or HHS found that AE produced a long-term delay in sexual initiation (three of these also found long-term reductions in sexual activity by sexually experienced teens). The rate of AE success was about one of two (47%) and the rate of harmful impact (6%) was about what could occur by chance. And there was strong evidence (nine studies) negating the concern that AE does harm by reducing the use of condoms.

Given the claims cited above, it may surprise some people that this database appears to show better evidence for AE than for CSE in U.S. schools. This is especially noteworthy considering the markedly fewer number of available AE studies, and the fact that unlike the CSE results, most of the AE evidence was produced by independent evaluators. The *amount* of evidence of effectiveness appeared somewhat greater for AE than for CSE in U.S. schools (seven AE studies vs. three CSE studies) and the success *rate* for AE programs (47%) appeared to be much higher than that of school-based CSE (15%).

It should also be noted that many factors outside the classroom influence adolescent sexual behavior—factors related to the home, peer, social media, and cultural environments. Significant and lasting increases in sexual risk avoidance may be amplified by a multi-pronged prevention strategy that addresses these various factors directly.

Our final observation is about program *potential* versus program *effectiveness*. Some CSE programs showed evidence of potential by producing effects that met more-lenient outcome standards. (See Tables 5–7 in the Appendix for these results.) However, according to the field of prevention research, these less-protective results do not justify designation as an effective program that can be disseminated and utilized with confidence. This view is reflected in the work of Blueprints for Healthy Youth Development, a registry of evidence-based programs to prevent the spectrum of youth risk behaviors, operated out of the University of Colorado. Based on its review of the research, as of this writing, the Blueprints website lists only five school-based CSE programs as "Promising"[78] and has not identified any as "Model Programs … deemed ready for widespread use."[79]

We end this discussion by raising some questions about ethics in sex education research that are suggested by these findings. First, an obvious question: is it ethical for governmental agencies to recommend the widespread implementation of the comprehensive sex education strategy in school classrooms if it has shown little evidence of real effectiveness? More particularly, is it ethical for the U.S. Teen Pregnancy Prevention

website to label a specific sex education program as showing "evidence of effectiveness" when it has been found to produce multiple harmful impacts on program participants? And finally, what rate of harmful impact is sufficient to cause policymakers to question the use of CSE in school classrooms? In the U.S., the rate of negative effects was one in eight studies, outside the U.S., one in five studies, and in African schools it was approximately one in four, an overall rate of roughly one in six studies globally.

Limitations

This study was a narrative review, not a meta-analysis in which study outcomes were combined statistically. Where comparisons were made across types of outcomes, by geographic region, or by program type, they were estimates meant to identify a pattern of evidence; we did not conduct statistical tests of differences. This study also did not report on the size of program effects in terms of the amount of behavioral change or the percentage of participants impacted, but rather looked to the statistical significance and duration of effects to identify important program outcomes. In addition, within this database of 120 studies—each of which had been vetted for adequate research rigor by at least one of three credible scientific agencies (UNESCO, CDC, HHS)—there was still meaningful variation between studies in the quality of the scientific methods employed. This observation underscores the need for more rigorous evidence about sex education effectiveness in school classrooms. Finally, it should be noted that the number of AE studies reviewed was small and limited to the U.S. Additional studies are needed in order to expand the AE evidence base and to determine if the positive AE findings are replicable.

Conclusions

When measured by a definition of effectiveness derived from the field of prevention research—sustained effects on key outcomes for the targeted population and without negative effects—a database containing 103 of the strongest and most current CSE studies, vetted for research quality by UNESCO, CDC, or HHS, shows very little evidence of CSE effectiveness in school settings around the world. In addition, more than a few CSE programs appear to be doing harm. When applying the same standards to AE in U.S. schools, the evidence—though limited—is more independent and looks more promising.

Recommendations

Evaluation studies of Comprehensive Sex Education should use a meaningful definition of effectiveness—similar to the one described in this paper—to measure program success. However, given the considerable lack of school-based CSE effectiveness found when applying such a standard to a credible international database, we recommend that policymakers pursue alternative prevention strategies for reducing the negative consequences of adolescent sexual activity. Further studies on the promising results for

Abstinence Education in the U.S. should be done to inform the development of such alternative paradigms.

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Appendix. Findings for each of 120 studies: Tables 5 – 7.

Table 5. U.S. School-based Comprehensive Sex Education (CSE): 60 Studies of 40 Programs.

PROGRAM AND STUDY			STUDY OUTCOMES									
PROGRAM NAME	STUDY 1st AUTHOR & YEAR	Independent Evaluator?	Negative Effect	Post-Program Main Effect on Most-Protective Indicators				Post-Program Main Effect on Less-Protective Indicators				Dual Benefit
				Sexual Initiation	Consistent Condom Use	Pregnancy	STDs	CondomFrequency	Frequ/RecentSex	UnprotectedSex	#SexPartners	12mo. Post-Program
Aban Aya (Classroom Version Only)	Flay, 2004	No	No	NM	NM	NM	NM	NS	NS	NM	NM	NM
AIDS Prevention Program	Siegel, 1995	?	No	NM	NM	NM	NM	NS	NM	NM	NS	NM
All4You	Coyle, 2006	No	No	NS	NM	NS	NM	6 months Only	6 months Only	6 months Only	NS	NS
All4You	Coyle, 2013	No	No	NS	NM	NM	NM	NS	NM	NS	NM	NS
All4You2 (Classroom Version Only)	Coyle, 2013	No	No	NS	NM	NM	NM	NS	NM	4 months Only	NM	NS
Be Proud Be Responsible (held on Saturday)	Jemmott, 1999	No	No	NM	NM	NM	NM	NM	NS	6 months	NS	NM
Be Proud Be Responsible (held on a school day)	Borawski, 2009	Yes	No	NS	NS	NM	NM	NM	NS	NS	NM	NM
[Blake] HIV/STD Prevention Curriculum	Blake, 2000 (unpub.)	Yes	No	NS	NS	NM	NM	NM	NS	NM	NM	NM
[Boyer] HIV/STD Prevention Curriculum	Boyer, 1997	No	No	NM	NM	NM	NM	NS	NM	NM	NS	NM
Crossroads Program (adaptation BPBR)	Slater & Mitschke,2015	?	No	NM	NM	NS	NM	NM	NM	6 months Only	NM	NM
¡Cuídate! (held on Saturday)	Villaruel, 2006	No	No	NS	12 months	NM	NM	NS	12 months	12 months	12 months	NS
¡Cuídate! (held on a school day)	Kelsey,2016;AbtAssoc,2015	Yes	3 Negative Effects	Negative Effect	NM	NS	NS	NS	Negative Effect	Negative Effect	NM	NM
Draw the Line,Respect the Line	Coyle, 2004	No	No	12 mo-Subgroup O	NM	NM	NM	NS	NS	NM	NS	NS
Focus on Kids/West Virginia	Stanton, 2005	No	No	NM	NM	NM	NM	NS	NS	NM	NM	NM
Gender Matters	Smith, Kim, et al, 2015	No	No	NS	NM	NM	NM	NM	NS	NS	NM	NM
Get Real About AIDS	Main, 1994	?	No	NS	NM	NM	NM	6 months	NS	NM	6 months	NM
Get Real -7th & 8th Grade Only	Grossman, 2014	?	No	<9 months	NM	NM	NM	NM	NM	NM	NM	NM
H.A.R.T. (adaptation of B.A.R.T.)	Boston Medical Center	?	No	NS	NM	NM	NM	NM	NS	NS	NM	NM
Health Teacher	MathmaticaPolicyResearch	No	No	NS	NM	NM	NM	NM	NM	NM	NM	NM
Healthy & Alive!	Middlestadt, [Unpubl]	No	No	NS	NS	NM	NM	NM	NS	NM	No	NM
Healthy for Life-Version 1 (Age-based)	Moberg, 1998/2000	?	No	NS	NS	NM	NM	NM	NS	NM	NM	NS
Healthy for Life-Version 2 (7th Gr.Intensive)	Moberg, 1998/2000	?	Recent Sex	NS	NS	NM	NM	NM	Negative Effect	NM	NM	NS
Healthy Oakland Teens	Ekstrand, 1996(AIDSConf)	?	No	8 to 11 months	NM	NM	NM	NM	NM	NM	NM	NM
HIV Prevention Interventions	Fisher, 2002	No	No	NS	NM	NM	NM	12 months	NM	NM	NM	NS
It's Your Game: Keep it Real/Risk Reduction	Tortolero, 2010	No	No	12 months	NM	NM	NM	NS	12 months	NM	NS	NS
IYG - Risk Reduction	Markham, 2012/2014	No	#Sex Partners	10 months Only	10 months Only	NM	NM	NM	10 months O	10 months O	Negative Effect	NS
IYG - Risk Reduction (South Carolina)	Potter, 2016a	Yes	Sexual Initiation	Negative Effect	NM	NM	NM	NM	NS	NS	NM	NS
IYG - Risk Reduction (Texas)	Coyle, 2016b	Yes	No	NS	NM	NM	NM	NM	NM	NM	NM	NM
Making Proud Choices! (held on Saturday)	Jemmott, 1998	No	No	NS	3 months Only	NM	NM	3, 6, 12 months	12mo-Subgroup	12mo-Subgroup	NM	NS
Need To Know	UofTxHlthSciCtrSanAntonio	?	No	NS	NM	NM	NM	NM	NM	NM	NM	NM
Positive Prevention	LaChausse, 2006	Yes	No	6 months	NM	NM	NM	NS	6 months	NM	NM	NM
Positive Prevention PLUS	LaChausse, 2015/2016	Yes	No	6 months	NM	NS	NM	NM	NM	6 months	NM	NM
Postponing Sexual Involvement(PSI)	Howard&McCabe,1990	No	No	12 months	NM	NM	NM	NM	NS	NM	NM	NM
Postponing Sexual Involvement	Aarons, 2000	Yes	No	NS	NM	NM	NM	NM	NM	NM	NM	NM
PSI & HumanSexuality-adapted	Little & Rankin, unpub.	?	No	NS	NM	NM	NM	NM	NS	NM	NS	NM
Project IMPPACT Inwood House	Lieberman, 2000	No	No	NS	NM	NS	NM	NS	NM	NM	NM	NS
Project LIGHT	Lightfoot, 2007	No	No	NM	NM	NM	NM	NS	3 months	NS	3 months	NM
Project SNAPP	Kirby, 1997	Yes	Contraception	NS	NM	NS	NS	Negative Effect	NS	NM	NM	NS
PromotingHealthAmongTeens!/CSE (on Saturday)	Jemmott, 2010	No	No	NS	NS	NM	NM	NM	NS	NS	24 months	NS
Reach for Health	O'Donnell, 1999	?	No	NS	NM	NM	NM	NM	NS	NM	NM	NM
Reducing the Risk (RTR)	Kirby, 1991	No	No	NS	NM	NS	NM	NS	NM	NS	NM	NM
RTR	Barth, 1992	No	No	NS	NM	NS	NM	NS	NS	NM	NM	NM
RTR	Hubbard, 1998	Yes	No	18months	NM	NM	NM	NM	NM	NM	NM	NM
RTR	Kelsey,2016;AbtAssoc,2016	Yes	Recent/OralSex	NS	NM	24mo-Subgroup O	NS	NM	Negative Effect	NS	NM	NS
RTR	Zimmerman, 2008a	No	No	NS	NM	NM	NM	NS	NM	NM	NM	NM
Reducing the Risk (RTR)-modified1	Zimmerman, 2008b	No	No	NS	NM	NM	NM	NS	NM	NM	NM	NM
RTR	Reyna & Mills, 2014a	Yes	No	NS	NM	NM	NM	NS	NM	NS	NS	NS
Reducing the Risk (RTR)-modified2	Reyna & Mills, 2014b	No	No	12 months	NM	NM	NM	NS	NM	NS	12 months	NS
Rochester AIDS Prevention Project(RAPP)	Siegel, 2001	?	No	NS	NM	NM	NM	NM	NM	NM	NM	NM
Rochester AIDS Prevention Project(RAPP)	Aten, 2002	?	No	NS	NM	NM	NM	NM	NM	NM	NM	NM
Safer Choices	Coyle, 2001	No	No	NS	NM	NM	NM	12 months	NS	NM	NS	NS
Teen Outreach Program (TOP)	Allen, 1997	Yes	No	NM	NM	atProgEnd-SubgrpO	NM	NM	NM	NM	NM	NM
TOP (Florida)	Daley, 2015	Yes	No	at Prog. End O	NM	at Prog.End O	NM	NM	NM	NM	NM	NM
TOP (Hennepin, MN)	Francis, 2015	Yes	No	NS	NM	NM	NM	NM	NS	NS	NM	NM
TOP (Chicago)	Seshadri, 2015	Yes	No	NM	NM	NM	NM	NM	NS	NS	NM	NM
TOP (GNWPP)	Philliber, 2016	Yes	Pregnancy	NM	NM	Negative Effect	NM	NM	NS	NM	NM	NM
TOP (held on Saturday)	Robinson, 2016	Yes	No	NS	NM	NM	NM	NM	NM	NS	NM	NM
[Walter&Vaughn]AIDS Prevention	Walter & Vaughn, 1993	?	No	NS	3 months	NM	NS	NM	NM	NM	3 months	NM
Wise Guys	Gottsegen, 2001	No	No	NS	NM	NM	NM	NM	NM	NM	NM	NM
Youth AIDS Prevention Project (YAPP)	Levy, 1995	No	No	NS	NM	NM	NM	NS	NS	NM	NS	NS

NM = Did not measure this outcome; NS = The study measured this outcome but the effect was not statistically significant at p<.05; F = Females; M = Males; O = Only; at Prog. End= measured at the program's endpoint

Green = Evidence of Program Effectiveness: A significant effect on a key protective indicator, at least 12 months post-program, on the intended target population (not just a subgroup), without other negative effects.

Blue = Evidence of Program Potential; Brown = Evidence of Program Failure (measured this outcome but failed to find a significant effect); Red = Evidence of Negative Program Impact; Grey = Program produced both positive and negative effects

Table 6. U.S. School-based Abstinence Education (AE): 17 Studies of 16 Programs.

PROGRAM AND STUDY			STUDY OUTCOMES								
			Post-Program Main Effect on Most-Protective Indicators				Post-Program Main Effect on Less-Protective Indicators				Dual Benefit
PROGRAM NAME	STUDY 1st AUTHOR & YEAR	Independent Evaluator?	Sexual Initiation	Consistent Condom Use	Pregnancy	STDs	CondomFrequency	Frequent/RecentSex	#Sex Partners		12mo. Post-Program
Choosing the Best	Weed, 2008	Yes	12 months	NM	NM	NM	NM	NM	NM		NM
Choosing the Best	Lieberman, 2012	Yes	3 months only	NM	NM	NM	NM	NS	NM		NM
For Keeps	Borawski, 2005	Yes	NS	NS	NM	NM	NM	NM	5 months		NM
Get Real-6th Grade Only	Erkut, 2012	Yes	12 months	NM	NM	NM	NM	NM	NM		NM
Heritage Keepers	Weed, 2011	Yes	12 months	NM	NM	NM	NM	NM	NM		NM
It's Your Game: Keep It Real/Abstinence-Only	Markham, 2012/2014	No	NS	(Unprotected Sex) 10/24mo	NM	NM	NM	NM	Negative Effect		NS
Making a Difference! An Abstinence Program	Jemmott, 1998	No	3 months only	NS	NM	NM	12 months	NM	NM		NS
My Choice, My Future	Trenholm, 2007	Yes	NS	NM	NS	NS	NS	NS	NS		NS
Positive Potential - 6th Grade	Piotrowski, 2016	Yes	12 months	NS	NM	NM	NM	12 months	NM		NS
Postponing Sexual Involvement/Abstinence-Only	Kirby, 1997	Yes	NS	NM	NS	NS	NS	NM	NS		NS
Promoting Health Among Teens/Abstinence-Only	Jemmott, 2010	No	24 months	NS	NM	NM	NM	24 months	NM		NS
Reasons of the Heart	Weed, 2008	Yes	12 months	NM	NM	NM	NM	NM	NM		NM
ReCapturing the Vision	Trenholm, 2007	Yes	NS	NM	NS	NS	NS	NS	NS		NS
Sex Can Wait	Denny, 2006	No	18 months	NM	NM	NM	NM	18 months	NM		NM
Teens In Control	Trenholm, 2007	Yes	NS	NM	NS	NS	NS	NS	NS		NS
Sex Respect, Teen-Aid, Values and Choices	Weed, 1992	Yes	NS	NM	NM	NM	NM	NM	NM		NM
WAIT Training	Rue, 2005	Yes	NS	NM	NM	NM	NM	NM	NM		NM

NM = Did not measure this outcome; NS = The study measured this outcome but the effect was not statistically significant at p<.05

F = Females; M = Males; O = Only; at Prog. End = measured at the program's endpoint

Green = Evidence of Program Effectiveness: A significant effect on a key protective indicator, at least 12 months post-program, on the intended target population (not just a subgroup), without other negative effects.

Blue = Evidence of Program Potential; Brown = Evidence of Program Failure (measured the outcome but the effect was not significant); Red = Evidence of Negative Impact; Grey = Program produced both positive and negative effects

Table 7. International (non-U.S.) School-Based Comprehensive Sex Education (CSE): 43 Studies of 39 Programs.

STUDY & PROGRAM			STUDY OUTCOMES									
			Negative	Post-Program Main Effect on Most-Protective Indicators				Post-Program Main Effect on Less-Protective Indicators				Dual Benefit
Study 1st Author & Year*	Program Name	Country	Effects	Sexual Initiation	Consistent Condom Use	Pregnancy	STDs	Any Condom Use	Frequent/RecentSex	Unprotected Sex	#Sex Partners	12mo. Post-Program
Ajuwon, 2007	Reproductive Health Education	Nigeria, Africa	No	NM	NM	NM	NM	End Of Program	NS	NM	NM	NM
Aderibigbe, 2008	HealthEducationOnRiskyBehavior	Nigeria, Africa	No	NM	NM	NM	NM	3 months	NS	NM	3 months	NM
Agha, 2004	Peer-led HIV/AIDS Prevention	Zambia, Africa	No	NM	NM	NM	NM	NS	6 months	NM	6 months	NM
Borgia, 2005	Peer-led HIV/AIDS Prevention	Rome, Italy	No	NM	NM	NM	NM	NS	NM	NM	NS	NM
Cartagena, 2006	Peer-led HIV/AIDS Prevention	Mongolia	No	NM	3yr-PostBaseline-Subgroup O	NM	NM	NM	NM	NM	NM	NM
Daboer, 2008	HIV/AIDS Health Education	Nigeria, Africa	No	6 months	NM	NM	NM	NM	NS	NM	NM	NM
Dente, 2005	HIV Education & Counseling	Uganda, Africa	No	NS	NS	NM	NM	NM	NM	NM	NS	NS
Diaz, 2005 (1)	EDUCARTE	Rio DeJaneiro, Brazil	No	NM	NM	NM	NM	NS	NS	NM	NM	NM
Diaz, 2005 (2)	Education:An Exercise in Citizenship	Salvador, Brazil	No	NM	NM	NM	NM	NS	NS	NM	NM	NM
Diaz, 2005 (3)	Sexuality & Affectivity Education	Belo Horizonte,Brazil	Recent Sex	NM	NM	NM	NM	NS	Negative Effect	NM	NM	NM
Diop, 2004	Accompanying The Future	Senegal, Africa	SI & Coerced Sex	Negative Effect	NM	NM	NM	NM	NS	15mo PostBaseline	NS	NS
Doyle, 2010	MEMA kwa Vijana	Tanzania, Africa	No	NS	NM	NS	NS	NS	NS	NM	NS	NS
Duflo, 2006	Critical Thinking	Kenya, Africa	No	NS	NM	NM	NM	6mo Subgroup O	NM	NM	NS	NM
Duflo, 2015	Critical Thinking	Kenya, Africa	No	NM	NM	NS	NS	NM	NM	NM	NM	NM
Dupas, 2011	Relative Risk Info Campaign	Kenya, Africa	SI & #Partners	Negative Effect	NM	1 year	NM	NS	NM	NM	Negative Effect	NS
Fawole, 1999	Sch-Bsd HIV/AIDS Education Prog.	Nigeria, Africa	No	NM	NS	NM	NS	NS	6 months	NM	6 months	NM
Fitzgerald, 1999	My Future is My Choice(MFMC)	Namibia, Africa	Condom Use	NS	NM	NM	NM	Negative Effect	NS	NM	NS	NM
Harvey, 2000	DramAide	South Africa	No	NS	NM	NM	NS	6 months	NM	NM	NS	NM
Henderson, 2007	SHARE	Scotland, UK	No	NM	NM	NS	NM	NM	NM	NM	NM	NM
James, 2006	HIV LifeSkills Program	KZN, SoAfrica	No	4mo Subgroup O	NM	NM	NM	atProgEnd-Subgroup O	atProgEnd-Subgroup O	NM	NM	NM
Jemmott, 2015	Let Us Protect Our Future	South Africa	No	NS	NS	NM	42mo Subgroup O	NS	NS	12 months	NS	NS
Jewkes, 2008	SteppingStones	South Africa	Paid Sex	NM	NM	NS	12 months	NS	Negative Effect	NM	NS	NS
Karnell, 2006	Our Times Our Choices(RTRadapted)	South Africa	No	NS	NM	NM	NM	NS	NM	NM	NM	NM
Li, 2008	FocusOnKids adapted	Nanjing,China	No	NS	NM	NM	NM	NS	NM	NM	NM	NM
Magnini, 2005	HIV LifeSkills Program	South Africa	No	NS	NS	NM	NM	2yr Post-Baseline	NS	NM	NS	NS
Martinez-Donate, 2004	CSE+Condom Distribution	Tijuana, Mexico	No	6 months	NM	NM	NM	NS	NS	NS	NM	NM
Maticka-Tyndale , 2010	PSABH	Kenya, Africa	No	11mo Subgroup O	NM	NM	NM	30mo Subgroup O	18mo(in past 3mo)	NM	NM	NS
Matthews, 2010 - Site 1	SATZ HIV Prevention Program	Cape Town, So.Africa	No	NS	NM	NM	NM	NS	NM	NM	NM	NS
Matthews, 2010 - Site 2	SATZ HIV Prevention Program	Mankweng, So.Africa	No	NS	NM	NM	NM	NS	NM	NM	NM	NS
Matthews, 2010 - Site 3	SATZ HIV Prevention Program	DarEsSalaam,Tanzania	No	11mo Subgroup O	NM	NM	NM	NS	NM	NM	NM	NS
Merakou, 2006	Peer-led HIV/AIDS Prevention	Athens, Greece	Sexual Initiation	Negative Effect	NM	NM	NM	6mo Post-Baseline	NM	NM	NM	NM
Okonofua, 2003	WomensHealth&ActionResourceCtr.	Nigeria, Africa	No	NM	NM	NM	1yrPostBsline	1yrPostBsl-Subgroup O	NM	NM	NM	NM
Ross, 2007	MEMA kwa Vijana	Tanzania, Africa	STDs	NS	NM	NS	Negative Effect	3yr Post-Baseline	NM	NM	3yrPostBsl-Subgroup O	NS
Smith, 2008	HealthWise South Africa	South Africa	Sexual Initiation	Negative Effect	NS	NM	NM	NM	NS	NM	NM	NM
Stanton, 1998	My Future is My Choice(MFMC)	Namibia, Africa	No	11mo Subgroup O	NM	NM	NM	6mo Subgroup O	NS	NM	NS	NS
Shuey, 1999	School Health Education	Uganda, Africa	No	2yr Post-Baseline	NM	NM	NM	NM	NS	NM	NS	NS
Stephenson, 2008	RIPPLE	England, UK	No	NS	NM	54 months	NM	NS	NM	NS	NM	NS
Taylor, 2014	Teen Pregnancy Prevention Prog.	KZN, South Africa	No	NS	NS	NS	NM	5 months	NM	NM	NM	NM
Thato, 2008	BeforeYouKnow/SmartLove	Thailand	No	NM	NS	NM	NM	NM	6 months	NM	NM	NM
Visser, 2007	Peer-led HIV/AIDS Prevention	South Africa	ForcedSex&#Partners	18mo Post-Baseline	NS	NM	NM	NM	18mo Post-Baseline	NM	Negative Effect	NS
Walker, 2006	HIVPrevention+EmergencyContrcptn	Mexico	No	NM	NM	NM	NM	NS	NM	NM	NM	NM
Wight, 2002	SHARE-Interim Evaluation	Scotland, UK	No	NS	NM	NS	NM	NS	NM	NS	NM	NM
Ye, 2009	HIV Education	China	No	NM	NM	NM	NM	NS	NM	NM	NM	NM

*In this table the studies were ordered alphabetically by author instead of by program because many of these international CSE programs had similar (generic) names, making the author's name a better way to identify studies/programs.
NM = Did not measure this outcome; NS = The study measured this outcome but the effect was not statistically significant at p<.05; F = Females; M = Males; O = Only; at Prog. End= measured at the program's endpoint; SI = Sexual Initiation
Green = Evidence of Program Effectiveness: A significant effect on a key protective indicator, at least 12 months post-program, on the intended target population (not just a subgroup), without other negative effects.
Blue = Evidence of Program Potential; Brown = Evidence of Program Failure (measured this outcome but failed to find asignificant effect); Red = Evidence of Negative Program Impact; Grey = Program produced both positive and negative effects
Note: Follow-up time periods shown in the cells indicate duration of effect *after the program's end* unless labeled as "Post-Baseline" which means effects were measured immediately following the end of a long-term program.