APPENDIX TABLE 1. Summary of included studies

Study	Setting	Intervention name and description	Study design and sample size	Population	Theories	Used participatory, learner-centered approach?	Gender or power included?	Duration of intervention	Significant, independent effect on				Other significant positive outcomes reported
									STIs	Childbearing	Pregnancy	STI or pregnancy combined	
Allen et al., 1997[84]	United States; 25 sites nationwide; high schools	Teen Outreach Program: Pregnancy and school failure prevention program; includes volunteer service, classroom discussions of service experience and curriculum-based group sessions	RCT; 695 participants; immediate postintervention follow-up	High school students grades 9–12 (85% female, 15% male); mean age, 15.8	Positive youth development approach; establishing competence and autonomy in a context of supportive relations with adult mentors	Yes (including group discussions, exercises, role plays, guest speakers and volunteer service)	Yes	9 months (school year)	NA	NA	+ (41% lower risk of pregnancy among females)	NA	Reductions in school suspension and course failure (42% and 39%, respectively)
Boyer et al., 2005[85]	United States; Marine recruit training base	FOCUS: Aims to prevent STIs, HIV and unintended pregnancy by improving knowledge about STIs, HIV, AIDS, pregnancy and contraception; modifying beliefs and attitudes that impact sexual behavior; and building communication, refusal and condom use skills	RCT; 2,157 participants; two follow-ups: One month post-training and 14 months after baseline	Female Marine recruits; 54% aged 17–18; 90% aged 21 or younger	Cognitive behavioral approach, focused on key elements of the information, motivation and behavioral skills model (IMB)	Yes (interactive group discussions and exercises, self-risk appraisal and videos)	No	Four 2-hour group sessions	0	NA	0	+ (23.9% of control group had an unplanned pregnancy or STI vs. 17.9% of the intervention group)	No main effects on any self-reported risk behavior (multiple partners, casual partners or condom use). Among participants not sexually experienced at baseline, intervention participants were less likely to have multiple partners or casual partners
Cowan et al., 2010;[86] Cowan et al., 2008[87]	Zimbabwe; southeastern rural districts; schools, community, health services	Regai Dzive Shiri: Youth programs for schools (used MEMA Kwa Vijana curriculum, adding sessions on gender issues, communication, self-belief and self-awareness) and out of school; community-based program for parents and stakeholders; youth-friendly clinics	RCT; 4,684 respondents; impact measured in cross-sectional population-based survey; follow-up: post-intervention, i.e., four years after baseline	Female and male secondary school students; mean age, 15 at baseline; final survey age, 18–22	Social learning theory and stages of change model	Yes (participatory, including participatory theater, storytelling and role plays)	Yes	Four years	0 (no effect on HIV or HSV-2)	NA	+ (among women: significant reduction in reported current or past pregnancies in intervention arm)	NA	For males: knowledge indicators and attitude (control around sexual refusal and rights within marriage). For females: knowledge indicators, condom self-efficacy, HIV testing self-efficacy, attitudes (safe sex and condoms, gender empowerment) and ability to go to clinic if need contraception

APPENDIX TABLE 1. Summary of included studies (continued)

Study	Setting	Intervention name and description	Study design and sample size	Population	Theories	Used participatory, learner-centered approach?	Gender or power included?	Duration of intervention	Significant, independent effect on				Other significant positive outcomes reported
									STIs	Childbearing	Pregnancy	STI or pregnancy combined	
Coyle et al., 2006[88]	United States; urban counties in northern California; schools	All4You!: Skills-based HIV, STI and pregnancy prevention curriculum delivered in classrooms and service learning activities	Cluster RCT; 988 participants; follow-ups: six, 12 and 18 months after baseline	High school students (63% male, 37% female); aged 14–≥18 years (>80% were aged 15–17)	Social cognitive theory, theory of planned behavior and social development theory	Yes (role playing, videos, group discussion, practicing correct condom use and volunteer service)	No	14-session program (about 26 hours total): nine sessions for curriculum (13.5 hours), and five sessions for service learning (12.5 hours)	NA	NA	0	NA	Improvement in three measures of condom use at six months; not significant at 12 and 18 months. Decrease in frequency of sex at six months. Decrease in non-steady partners without a condom at 18 months. Overall increase in condom and HIV knowledge. Condom self-efficacy and attitudes and beliefs about condoms favored controls. No effect on number of times tested for HIV and other STIs
DiClemente et al., 2004[89]	United States; Birmingham, AL; community health agencies	SIHLE: Skills-based HIV prevention curriculum, emphasizing gender and ethnic pride, HIV knowledge, communication, condom use skills and healthy relationships	RCT; 522 participants; follow-ups: six and 12 months	Black adolescent females seeking services at community health agencies; aged 14–18; mean age, 16	Social cognitive theory and theory of gender and power	Yes (interactive group sessions, including reading poetry, role plays, cognitive rehearsal, group discussions and practicing condom use)	Yes	Four 4-hour sessions	+ (reduction in chlamydia over 12- month follow-up; no effects for trichomonas or gonorrhea)	NA	+ (reduction at six months, but no difference at 12 months)	NA	Multiple: Three measures of condom use increased; decrease in new partners; improvement in HIV knowledge, partner communication, condom use self-efficacy and observed condom use skills, among other positive outcomes

APPENDIX TABLE 1. Summary of included studies (continued)

Study	Setting	Intervention name and description	Study design and sample size	Population	Theories	Used participatory, learner-centered approach?	Gender or power included?	Duration of intervention	Significant, independent effect on				Other significant positive outcomes reported
									STIs	Childbearing	Pregnancy	STI or pregnancy combined	
DiClemente et al., 2009[90]	United States; Atlanta, GA; clinics providing sexual health services to adolescents	HORIZONS: Group STI and HIV prevention sessions; fosters sense of cultural and gender pride; addresses individual, relational and social factors that contribute to STI and HIV risk; vouchers for male partners for STI screening and treatment; four brief telephone contacts to reinforce prevention information	RCT; 715 participants; follow-ups: six and 12 months	Black females attending sexual health clinics; aged 15–21; mean age, 17.8	Social cognitive theory and theory of gender and power	Yes (interactive; group discussion, role plays, practicing communication and condom skills)	Yes	Two 4-hour group sessions	+ (intervention had 35% lower risk of acquiring chlamydia; and RR 0.25 for recurrent chlamydia; 0 for gonorrhea and trichomoniasis)	NA	NA	NA	Increases for several measures of condom use; decreased douching; increased partner communication; increased condom use self-efficacy and increased STI and HIV prevention knowledge
Dupas, 2011[91]	Kenya; two rural districts in western Kenya; schools	Relative Risk Information Campaign: Video on "sugar daddies"; discussion of risk of cross-generational sex and gender- and age-disaggregated data on HIV prevalence in nearby city	RCT; 328 primary schools; three follow-ups: 5–8 months, 9–12 months, 10–14 months	Grade 8 female and male students; mean age, 15	Clear pathway of behavior change specified	Yes (interactive group discussion, critical thinking, learner-centered)	Yes	40 minutes	Not available	+ (28% decrease in childbearing)	Not available	Not available	Reduced pregnancies by older partners by 62%; reduced number of partners that are >5 years older
Fawole et al., 1999[92]	Nigeria; Ibadan; schools	Comprehensive health education: HIV and AIDS education aimed to improve knowledge and attitudes and reduce sexual risk behaviors; includes condom demonstration	Longitudinal controlled cohort; 450 participants; follow-up: six months	Female and male public secondary school students; mean age, 17.6 (experimental) and 17.8 (control)	Not specified	Yes (films, role plays, stories, songs, debates, essays and condom demonstration)	No	Six 2–6 hour sessions	0	NA	NA	NA	Knowledge improved; attitudes about people living with AIDS improved; some reported behaviors improved (mean number of sexual partners and proportion of students who are sexually active), but no change in condom use

APPENDIX TABLE 1. Summary of included studies (continued)

Study	Setting	Intervention name and description	Study design and sample size	Population	Theories	Used participatory, learner-centered approach?	Gender or power included?	Duration of intervention	Significant, independent effect on				Other significant positive outcomes reported
									STIs	Childbearing	Pregnancy	STI or pregnancy combined	
Jemmott et al., 2005[93]	United States; Philadelphia, PA; adolescent medicine clinic in a children's hospital	Sisters Saving Sisters: Skills-based HIV and STI risk reduction curriculum emphasizing knowledge, attitudes and skills for condom negotiation and use	RCT; 682 participants; follow-ups: three, six and 12 months	Black and Latina females attending adolescent clinic; aged 12–19; mean age, 15.5	Theory of reasoned action, social cognitive theory and theory of planned behavior	Yes (interactive and skills- based, including exercises, games, group discussions, practicing correct use of condom and role play)	No	One 4.5-hour session	+ (lower percentage tested positive for an STI at 12 months, when comparing skills vs. health arms [no difference comparing skills vs. info arms])	NA	NA	NA	Multiple: Skills vs. health arms also showed positive changes for condom use; number of partners; HIV and STI knowledge; condom use intention; and confidence that they can use condoms skillfully
Jewkes et al., 2008[94]	South Africa; rural setting, Eastern Cape; community	Stepping Stones: Adapted for South Africa, participatory HIV prevention program that aims to improve sexual health by building stronger, more gender equitable relationships	RCT; 1,360 males, 1,416 females; follow-ups: 12 and 24 months	Females and males aged 15–26; 75% aged ≤19 (50% of ≤19 were ≤17)	Socioecological model of behavior change	Yes (participatory learning, including critical reflection, roleplay, and drama; draws on participants' everyday lives)	Yes	50 hours over 6–8 weeks (13 3-hour single sex sessions, three meetings with male and female groups, and one community meeting)	+ (33% reduction in HSV-2 incidence for males and females) 0 (for HIV for males and females)	NA	0	NA	Lower percentage of males reported having transactional sex at 12 months (disappeared at 24 months); lower percentage of males reported intimate partner violence at 24 months

APPENDIX TABLE 1. Summary of included studies (continued)

Study	Setting	Intervention name and description	Study design and sample size	Population	Theories	Used participatory, learner-centered approach?	Gender or power included?	Duration of intervention	Significant, independent effect on				Other significant positive outcomes reported
									STIs	Childbearing	Pregnancy	STI or pregnancy combined	
Kirby et al., 1991[95]	United States; California; high schools	Reducing the Risk: Curriculum focuses on knowledge, attitudes and skills that will help students avoid unprotected sex, either through abstinence or using condoms or contraceptives	Quasi-experimental; 758 participants; follow-ups: six and 18 months	High school students (47% male, 53% female); 56% in 10th grade; mean age, 15.3	Social learning theory, social inoculation theory and cognitive behavior theory	Yes (interactive, skills-based, includes role plays, activities and class discussions)	No	16 45–50-minute sessions (at the time of this evaluation, Reducing the Risk was 15 sessions)	NA	NA	0	NA	Increased knowledge and reduced unprotected sex among females who were sexually inexperienced at baseline (no effects on sexual initiation or recent sexual activity; no effect on contraceptive use for the entire sample)
Kirby et al., 1997[96]	United States, Los Angeles, CA; middle schools	Project SNAPP: Pregnancy and HIV prevention program that aims to delay sexual initiation and increase condom use among youth who do have sex; includes increasing knowledge, communication and negotiating skills, and self efficacy regarding those skills	RCT; 1,657 participants; follow-ups: five and 17 months	7th grade classes (46% male, 54% female); mean age, 12.3	Social learning theory and health belief model	Yes (interactive and skills-based, uses games, role plays, group activities and guided discussion)	No	Eight sessions delivered over a 2-week period	0	NA	0	NA	Knowledge increased and two out of 21 attitudes and beliefs improved; no change in sexual or contraceptive behaviors or condom use
Lieberman et al., 2000[97]	United States; New York, NY; middle schools	IMPPACT: Small group-based; emphasizes abstinence and discusses contraception; aims to provide accurate information about sexuality, pregnancy and disease prevention; build communication skills; and create peer groups supportive of healthy behaviors	Longitudinal controlled cohort; 312 respondents; two follow-ups: after program completed and 12 months	Middle school students (67% female, 33% male); mean age, 12.9	Small group model based on social cognitive theory	Yes (group discussion, activities, learner-centered, builds communication skills)	No	12–14 sessions, 35–45 minutes each, over one semester	NA	NA	0	NA	Increases in locus of control and parental relationship variables; no change in self efficacy, sexual initiation or condom use

APPENDIX TABLE 1. Summary of included studies (continued)

Study	Setting	Intervention name and description	Study design and sample size	Population	Theories	Used participatory, learner-centered approach?	Gender or power included?	Duration of intervention	Significant, independent effect on				Other significant positive outcomes reported
									STIs	Childbearing	Pregnancy	STI or pregnancy combined	
Mitchell-DiCenso et al., 1997[98]	Canada; Hamilton, ON; schools	McMaster Teen Program: Small coed groups; includes accurate information about reproductive system and puberty; offers strategies for developing responsible relationships and communication and problem-solving skills, and provides practice for implementing decisions	RCT; 3,374 participants; five follow-ups: immediately postprogram and then annually for four years	Female and male students in grades 7 and 8; mean age, 12.6	Cognitive behavioral model	Yes (learn and practice decision-making and problem-solving skills)	No	10 one-hour sessions	NA	NA	0	NA	No positive effects reported
Nicholson and Postrado, 1992[99]	United States; Dallas, TX, Memphis, TN, Omaha, NE, and Wilmington, DE; community	Girls Inc. Preventing Adolescent Pregnancy Program: Includes "Growing Together" (for participants and parents to increase comfort and skill in communicating about sexuality), "Will Power/Won't Power" (assertiveness training to postpone sexual initiation), "Taking Care of Business" (to increase participants' motivation to avoid pregnancy through education and career planning), and "Health Bridge" (connects participants to health services, including reproductive health services)	Longitudinal cohort with comparison group; 343 participants; follow-up: 2 years	Adolescent females at Girls Inc. sites; aged 12–15 at start of the study	Social learning theory and life options model	Yes (interactive, including exercises, role play, discussions and films)	Yes	Growing Together: five 2-hour sessions; Will Power/Won't Power: six 2-hour sessions; Taking Care of Business: nine 2-hour sessions. Participants could participate in as many programs as they wanted	NA	NA	0 (participation in one or more components related to lower likelyhood of becoming pregnant, but marginally significant)	NA	No change in having intercourse without birth control

APPENDIX TABLE 1. Summary of included studies (continued)

Study	Setting	Intervention name and description	Study design and sample size	Population	Theories	Used participatory, learner-centered approach?	Gender or power included?	Duration of intervention	Significant, independent effect on				Other significant positive outcomes reported
									STIs	Childbearing	Pregnancy	STI or pregnancy combined	
Philliber et al., 2002[100]	United States; New York, NY; after-school youth agencies serving inner-city populations	Children's Aid Society–Carrera Program: Focuses on reducing pregnancy; uses a youth development model (including job, academic, individual sports and art components), combined with comprehensive sexuality education, contraceptive provision, and medical and mental health care	RCT, 484 participants; follow-up: three years	Disadvantaged adolescents (55% female, 45% male); aged 13–15	Positive youth development approach; principles include treating youth as part of the family and viewing each young person as pure potential—"at promise" instead of "at risk"	Yes (including interactive activities, group discussion and critical reflection)	Yes	3 years, year-round, participants attended about 16 hours per month (activities were available five days per week, about 3 hours per day)	NA	NA (did bivariate only for this; too few births to analyze)	+ (female participants had one-third the odds of becoming pregnant of control females; no difference among males)	NA	Females also had reduced odds of currently being sexually active and elevated odds of having used a condom and hormonal contraceptive; having received good health care was significant for both males and females
Ross et al., 2007[101] (also Obasi et al., 2006;[102] Doyle et al., 2010[103])	Tanzania; rural Mwanza region; schools, community, health services	MEMA kwa Vijana: Multicomponent program to reduce HIV, STIs, pregnancy and sexual risk behavior; includes sexuality education in schools (focuses on provision of accurate information, promotion of specific desirable behaviors and addressing misconceptions), youth friendly sexual and reproductive health services, community-based condom distribution, community-wide awareness raising activities	RCT; 9,645 participants; follow-up of cohort at three years and cross-sectional survey at 9 years postintervention	Adolescent females and males aged ≥14 who were in grades 4–6 of government primary schools; mean age, 15.7	Social learning theory	Yes (participatory, including drama, stories, and games)	Yes (but limited)	Three years: 12 40-minute sessions per year (participants entering grade 7 received only one year of the school-based component, those entering grade 6 received two years and those entering 5th grade received three years)	– (increase in gonorrhea in intervention arm at three years for females but disappeared at nine years)	NA	0	NA	Increase in knowledge and attitudes about situations when female can refuse sex (significant at three years, not at nine); fewer partners for males; more condom use reported on two measures for males (significant at three years, not at nine) and for females on one measure (a different measure at three years than at nine years)

APPENDIX TABLE 1. Summary of included studies (continued)

Study	Setting	Intervention name and description	Study design and sample size	Population	Theories	Used participatory, learner-centered approach?	Gender or power included?	Duration of intervention	Significant, independent effect on				Other significant positive outcomes reported
									STIs	Childbearing	Pregnancy	STI or pregnancy combined	
Smith, Weinman and Parrilli, 1997[104]	United States; Houston, TX; teen health clinics at public hospitals	Condom motivation education: Small group; focuses on STI prevention and condom use	Longitudinal controlled cohort; 205 participants; follow-up: six months	Females attending teen health clinic; mean age, 17.3	Information, motivation and behavior skills model	Yes (included games, coaching on responding to partners' reluctant to use condoms and condom demonstration)	No	One 30–45 minute class	0	NA	NA	NA	No other outcomes reported
Thurman et al., 2008[105] (also Shain et al., 1999[106])	United States; San Antonio, TX; public health clinics	Project SAFE: Group-based behavioral intervention; helps participants recognize risk of contracting STIs, commit to behavior change and acquire the skills necessary to affect change; covers gendered sexual scripts, relationships and power	RCT; 148 respondents; follow-up: six and 12 months	Black and Latina females attending public health clinics; aged 14–18	Health belief model, self-efficacy theory, decision-making models and diffusion theory	Yes (role playing, interactive video, games and group discussion)	Yes	Three 3-hour sessions	+ (intervention less likely to have an STI (gonorrhea or chlamydia)	NA	NA	NA	Behavioral outcomes including multiple partner-related variables and douching
Walter et al., 1993[107]	United States; New York, NY; high schools	AIDS prevention curriculum: Aims to improve AIDS-related knowledge and beliefs, and to teach skills necessary for preventive behaviors	Longitudinal controlled cohort; 1,201 participants; follow-up: three months	Public high school students (41.5% male, 58.5% female); ninth and 11th grade; mean age, 15.7	Health belief model, social cognitive theory and model of social influence	Yes (including values clarification; role plays; negotiation skills for delaying sexual initiation and using condoms; and skills necessary to obtain condoms and use them correctly)	No	Six 1-class period sessions	0	NA	NA	NA	Significant effects for knowledge, beliefs (about susceptibility to HIV, benefits of and barriers to prevention, and norms about involvement in AIDS prevention), self-efficacy to perform AIDS-prevention actions, and lower levels of sexual risk behavior

APPENDIX TABLE 1. Summary of included studies (continued)

Study	Setting	Intervention name and description	Study design and sample size	Population	Theories	Used participatory, learner-centered approach?	Gender or power included?	Duration of intervention	Significant, independent effect on				Other significant positive outcomes reported
									STIs	Childbearing	Pregnancy	STI or pregnancy combined	
Wang et al., 2005[108]	China; suburban Shanghai; community	Comprehensive sex education: Covers abstinence, contraception, and healthy and safer sexual behaviors; includes several separate components: facilitated group discussions; lectures; videos; informational materials; provision of reproductive health services, counseling and contraceptives	Longitudinal controlled cohort; 2,042 respondents; follow-up: immediately postintervention	Unmarried females and males; aged 15–24; mean age, 18.5 (54–57% were ≤18)	Not stated	Not clear, possibly limited (group discussions covered correct condom use, skills needed in sexual negotiation and decision-making, but teaching methods were not specified)	No	20 months	NA	NA	0	NA	Significant effect for reduced coerced sex, increased contraceptive use and increased condom use
Wight et al., 2002[109] (also Henderson et al., 2007[110])	United Kingdom; Scotland; schools	SHARE: Aims to reduce unwanted pregnancies, reduce unsafe sex and improve the quality of sexual relationships; includes sessions on relationships, male and female anatomy, positive body image, pregnancy, contraception, STIs, condoms, communication skills, resisting pressure for sex, pregnancy and parenthood, and negotiating condom use	RCT; 5,854 respondents; follow-up: two and 4.5 years	Two successive cohorts of female and male third-year secondary school students; aged 13–14	Social psychological cognitive models and sociological interpretations	Yes (small group work, games, interactive video and role playing)	No	20 sessions: 10 in third year of secondary school and 10 in fourth year	NA	NA	0	NA	No differences in behavioral outcomes; males reported less regret of first intercourse with most recent partner; sexual health knowledge scores increased for males and females

Notes: RCT=randomized controlled trial. NA=not assessed.