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A Critical Review of the Characteristics of Theater-Based HIV Prevention Interventions for Adolescents in School Settings

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Abstract

Theater-based interventions are a viable prevention strategy for changing sexual health knowledge, attitudes, and behaviors related to HIV prevention. However, few studies have explored interventions in English-speaking, high-income countries such as the United States, Canada, or the United Kingdom. This article critically reviews the literature to identify key characteristics of theater-based HIV prevention strategies used for adolescents in school-settings in the United States, Canada, and the United Kingdom. Specifically, we identify the theatrical approach used in HIV prevention interventions, the behavioral theories that inform such interventions, and the study design and results of existing evaluation studies conducted in school settings. In the 10 articles reviewed, we found limited grounding in theory and the use of nonrigorous study design. To strengthen the evidence and practical application of theater-based HIV prevention interventions, we highlight three specific recommendations for practitioners and researchers: (1) define and operationalize the theater approach and techniques used, (2) ensure theater-based interventions are grounded in theory, and (3) conduct rigorous evaluation of theater-based interventions. These recommendations are key to strengthening future research on and implementation of theater-based interventions for HIV prevention.

Keywords

child/adolescent health; health education; HIV/AIDS; curriculum; sexual health; behavior change theory; learning theory

INTRODUCTION

Public health practitioners and researchers have used innovative approaches to health promotion to convey information about social norms, peer norms, protective health behaviors, and disease prevention. Theater-based interventions in particular have been

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documented as a popular health education method (Glik, Nowak, Valente, Sapsis, & Martin, 2002). These interventions have used various theatrical approaches including Theater of the Oppressed (TO), Process Drama, Popular Theater, Drama in Education, and Theater in Education (see Table 1), all of which include techniques such as improvisation, role-play, and vignettes to communicate information and/or engage audience members (Conrad, 2004; Joronen, rankin, & Åstedt-Kurki, 2008; Simons, 2011).

Theater-based interventions have been used successfully to address a variety of public health concerns, particularly among traditionally hard-to-research populations. Researchers have documented interventions targeting issues of substance use, obesity, sexual health, and mental illness (Haines, Neumark-Sztainer, & Morris, 2008; Hernandez et al., 2007; Joronen et al., 2008; Stephens-Daykin et al., 2008). Practitioners have targeted theater-based interventions to a wide range of populations, including incarcerated individuals, farm-workers, recent immigrants, refugees, adults, and adolescents (Hovey, Booker, & Seligman, 2007; Lauby et al., 2010; Lieberman, Berlin, Palen, & Ashley, 2011).

Researchers who study the public health impact of theater-based interventions with adolescents have identified several benefits to this approach. First, the interactive nature of these interventions creates an emotional experience for the participant that affects attitudes at a deeper level compared to traditional didactic teaching methods (Joronen et al., 2008; Lieberman et al., 2011). Second, researchers have praised the cultural and developmental appropriateness of these interventions when they use actors who resemble participants (e.g., similar ages and ethnicities; Lieberman & Berlin, 2005). Third, previous evaluations of theater-based interventions have demonstrated that adolescents find these approaches acceptable and memorable (Lieberman & Berlin, 2005; Lightfoot, Taboada, Taggart, Tran, & Burtaine, 2015; McEwan, Bhopal, & Patton, 1991). These findings demonstrate great potential for providing theater-based sexual health education that is developmentally accessible, engaging, and culturally acceptable to adolescents.

Nearly half of all high school students in the United States (46.8%) report having had sexual intercourse and are potentially at risk for HIV and other sexually transmitted infections (STIs; Centers for Disease Prevention and Control [CDC], 2014). Youth ages 13 to 24 are at particularly high risk of contracting HIV, accounting for 26% of all new HIV infections in the United States in 2010, despite only making up 17% of the total U.S. population (CDC, 2012). Theater-based interventions are a viable prevention strategy that can be used to change sexual health knowledge, attitudes, and risky behaviors (Daykin et al., 2008; Glik et al., 2002; Joronen et al., 2008).

The majority of published studies about theater-based interventions addressing HIV prevention are among adolescents in developing countries (Daykin et al., 2008; Glik et al., 2002; Joronen et al., 2008). Few studies have evaluated interventions in English-speaking, high-income countries such as the United States, Canada, or the United Kingdom (Glik et al., 2002; Kamo, Carlson, Brennan, & Earls, 2008; Simons, 2011), where the incidence of HIV is increasing among adolescents. Most studies that evaluated theater-based interventions for HIV prevention in high-income countries have focused on actors' behavioral changes (Grewe et al., 2015); however, to our knowledge, few studies have

evaluated changes in participant behaviors (Daykin et al., 2008; Glik et al., 2002; Joronen et al., 2008; Lightfoot et al., 2015; Simons, 2011). As theater-based approaches continue to gain popularity and accumulate evidence of their effectiveness, more robust research is needed to understand how such interventions work, and what makes them successful and replicable in adolescent populations.

The purpose of this article is to conduct a literature review of the key characteristics of theater-based HIV prevention strategies used among adolescents in school settings in the United States, Canada, and the United Kingdom. Given the importance of schools and interpersonal networks in adolescent sexual socialization (L'Engle & Jackson, 2008), we selected school settings because they are prime locations for delivering HIV prevention interventions to adolescents. Additionally, schools provide access to a large population of adolescents, which may facilitate intervention scale-up efforts. Specifically, we identify the theatrical approach (e.g., dramatic or theatrical techniques such as plays, vignettes, or interactive scenes) used in school-based HIV prevention interventions, the behavioral theories that inform such interventions, and the study design and results of existing evaluation studies conducted in school settings. In the discussion, we provide recommendations for future research on and implementation of theater-based HIV prevention interventions, and finally, we share the application of these recommendations in one theater-based sexual health intervention implemented in a school setting in North Carolina.

METHOD AND REVIEW PROCESS

Aims

This review was conducted to answer three research questions:

Research Question 1: What are the key theatrical approaches used in theater-based HIV prevention interventions?

Research Question 2: What behavioral frameworks and theories have guided past interventions and their evaluation?

Research Question 3: What are the study characteristics, including study design, sample size, randomization, and attrition, and what outcomes have been measured through the implementation and evaluation of theatrical approaches?

Search Methods

Our search was conducted in January 2013 using PubMed, Google Scholar, and the Applied Social Sciences Index and Abstracts. Search terms included variations of participatory theater ("interactive theater," "forum theater," "theater in education," "drama in education," "Boalian theater," "theater of the oppressed"), HIV ("STI," "STD," "AIDS," "sexual health," "reproductive health"), and adolescents ("youth," "high school," "secondary school"). Authors also performed manual searches of references from relevant articles.

Inclusion Criteria

Studies were included if they (1) used theater approaches to deliver an intervention to prevent HIV or promote sexual health among middle and high school students ages 11 to 19 in high-income countries, (2) collected outcomes data to assess efficacy, and (3) took place in nonclinical, school-based settings. Additionally, we included only English-language articles published within the past 25 years in peer-reviewed journals to ensure quality. Due to the small number of existing studies, both experimental and quasi-experimental study designs with mixed methods were included.

Exclusion Criteria

In addition to the parameters discussed for inclusion of articles, the authors excluded articles if (1) the intervention did not use theater approaches to address HIV prevention or sexual health promotion, (2) the intervention did not target young people ages 11 to 19 or targeted only specific groups of at-risk adolescents outside of school settings (e.g., adolescent drug users, a specific minority group, farmworker adolescents), (3) the intervention took place in a clinical or community setting without a school affiliation, (4) the primary outcomes were measured using only qualitative methods, or (5) the study took place in a low-income country.

Search Outcome

Our initial search yielded 156 articles. We completed abstract and full-text review to identify all studies meeting the inclusion and exclusion criteria. Two researchers (AT and AH) independently reviewed and evaluated all retrieved abstracts and full texts, and reached consensus on the inclusion for analysis. The interrater reliability between reviewers was .90, an indicator of strong agreement. Discrepancies were discussed until consensus was reached. Figure 1 summarizes the process by which articles were considered and either included for further review or excluded. Ten articles (Campbell, Bath, Bradbear, Cottle, & Parrett, 2009; Causey, Zuñiga, Bailer, ring, & Gil-Trejo, 2012; Denman, Pearson, Moody, Davis, & Madeley, 1995; Elliott, Gruer, Farrow, Henderson, & Cowan, 1996; Guzmán, Casad, Schlehofer-Sutton, Villanueva, & Fera, 2003; Lieberman & Berlin, 2005; Lieberman et al., 2011; McDonald, Williams, & Carter 2011; McEwan et al., 1991; Ponzetti, Selman, Munro, Esmail, & Adams, 2009) met inclusion criteria and explored different approaches to theater-based interventions targeted at adolescents in school-based setting in the United States, Canada, and the United Kingdom.

Data Abstraction

Each article was reviewed by a member of the research team (AH) using a standardized abstraction form. The form was organized by a basic table, with space to write in details for the following categories: study design, sample, setting, intervention activities, theoretical approach, measures assessed, and key findings. The abstraction form was then reviewed and compared to the article by another member of the research team (AT). Any suggested changes or additions were determined through discussion and incorporated into the abstraction form before being finalized.

Results

The findings are organized by each of the three research questions that guided the literature review and presented below. The references to theory, both in terms of key theatrical approaches and behavioral frameworks, were limited, and results are described for each article reviewed ($n = 10$). Each study included in the literature review was also abstracted to identify research design, methods, sample, and retention.

Theater Approaches

Four of the articles reviewed specified Theater in Education as guiding the intervention (Denman et al., 1995; Elliott et al., 1996; McEwan et al., 1991; Ponzetti et al., 2009). The remaining six articles reviewed did not identify a specific theater approach used, but four of those six articles used phrases such as “educational theater” (Guzmán et al., 2003; Lieberman et al., 2011) or “theater education” (Lieberman & Berlin, 2005; McDonald et al., 2011). The two remaining articles broadly referenced arts-based approaches as the basis for the intervention (Campbell et al., 2009; Causey et al., 2012).

Behavioral Frameworks and Theories

Six of the articles reviewed discussed specific social and behavioral science theories that informed the intervention (see Table 2). Three interventions were described as being informed by multiple behavioral theories (Lieberman & Berlin, 2005; Lieberman et al., 2011; Causey et al., 2012). Social cognitive theory (SCT) or theories stemming from SCT informed three of the interventions (Guzmán et al., 2003; Lieberman & Berlin, 2005; Lieberman et al., 2011). Several articles also mentioned the theory of reasoned action (TRA; Causey et al., 2012; Lieberman et al., 2011), the theory of planned behavior (TPB; Causey et al., 2012), the health belief model (HBM; Lieberman & Berlin, 2005), the information-motivation-behavior model (Campbell et al., 2009), social inoculation theory (Lieberman & Berlin, 2005), and positive youth development (McDonald et al., 2011). Four articles did not mention any guiding behavioral framework or theory (Denman et al., 1995; Elliott et al., 1996; McEwan et al., 1991; Ponzetti et al., 2009).

Study Characteristics

All 10 studies included in this review except for Elliott et al. (1996) and Causey et al. (2012) used preexperimental (Campbell et al., 2009; McEwan et al., 1991; Ponzetti et al., 2009) or quasi-experimental study designs (Denman et al., 1995; Guzmán et al., 2003; Lieberman & Berlin, 2005; Lieberman et al., 2011; McDonald et al., 2011).

Outcomes related to knowledge, attitudes/beliefs, behavioral intention, and behavior were measured across all studies (see Table 3). Eight of the studies reviewed reported measuring knowledge related to risk behaviors, condom use and efficacy, HIV transmission, and pregnancy prevention (Campbell et al., 2009; Denman et al., 1995; Elliott et al., 1996; Guzmán et al., 2003; Lieberman & Berlin, 2005; Lieberman et al., 2011; McDonald et al., 2011; McEwan et al., 1991). Nine of the studies reviewed measured sexual health attitudes and beliefs, including increased self-efficacy for condom use and communication with partners, improved understanding of sexual health options, responsibility and decision

making, and stigma reduction toward people living with HIV/AIDS (PLWHA; Campbell et al., 2009; Causey et al., 2012; Denman et al., 1995; Elliott et al., 1996; Guzmán et al., 2003; Lieberman & Berlin, 2005; Lieberman et al., 2011; McEwan et al., 1991; Ponzetti et al., 2009).

Eight of the studies measured behavioral intentions regarding becoming sexually active, risk behavior, condom use, and other contraceptive use (Causey et al., 2012; Elliott et al., 1996; Guzmán et al., 2003; Lieberman & Berlin, 2005; Lieberman et al., 2011; McDonald et al., 2011; McEwan et al., 1991; Ponzetti et al., 2009), although only two of the studies measured behavior change at follow-up (Causey et al., 2012; Elliott et al., 1996).

DISCUSSION

Our review yielded 10 studies that used a theater-based approach for HIV prevention among high school students in the United States, Canada, and the United Kingdom. Theater-based interventions are a novel and unique way to address HIV prevention for adolescents, and previous studies indicated great potential for changes in knowledge, attitudes, and behavior. However, our analysis revealed several gaps in how theater-based interventions are currently implemented and evaluated. Our review identified three key findings to strengthen the evidence and practical application of theater-based interventions for HIV prevention in high-income countries. We suggest research teams (1) define and operationalize the theater approach and techniques used, (2) ensure theater-based interventions are grounded in theory, and (3) conduct rigorous evaluation of theater-based interventions. In the following section, we discuss these key findings, provide recommendations for practitioners, and then explore an example from a theater-based HIV prevention intervention developed by our research team using findings from this review.

Define and Operationalize the Theater Approach Guiding the Intervention

Previous reviews suggested that researchers and practitioners operationalize and evaluate new theoretical constructs and concepts within the novel context of theater-based health interventions (Daykin et al., 2008; Joronen et al., 2008). Our review supported this suggestion; however, prior to developing new concepts, an important first step is to clearly define and operationalize theater-based approaches as they are currently applied. Only 4 of the 10 interventions in the review specified the theater approach used and described in detail how the intervention worked. Without describing the theoretical underpinnings of the approach or the specific techniques employed, it is difficult to demonstrate the utility of different approaches or to disseminate successful interventions for replication and scale up.

Moreover, a clear understanding of the theatrical theories guiding interventions can be integrated with behavioral theory to more accurately measure intervention efficacy (Glanz, Rimer, & Viswanath, 2008). While theater approaches rarely focus on domains and constructs in the same way that behavioral theories do, understanding the assumptions behind the techniques is an important step to identifying parallel change mechanisms from the behavioral sciences. We recommend using a transdisciplinary approach to foster collaboration between theater and public health practitioners to strengthen study design, implementation, and evaluation (Emmons, Viswanath, & Colditz, 2008). Implementing a

transdisciplinary approach to intervention development and evaluation allows for a more nuanced and comprehensive understanding of the intervention based on the application of diverse theater-based and behavioral science theories.

Ensure Theater-Based Interventions Are Grounded in Theory

The existing literature overwhelmingly supported the use of behavioral theory to guide theater-based interventions and the evaluation of these interventions. However, only 6 of the 10 interventions in this review mentioned the use of common behavioral theories, including SCT, TRA/TPB, and HBM, to design their intervention. Theater-based interventions provide participants with an opportunity to observe actors perform desired behaviors and then practice those behaviors by taking part in the action (Guzmán et al., 2003; Lieberman et al., 2011). As such, the majority of theater-based interventions used SCT and focused on the observational learning and social modeling components of the theory, omitting any discussion on altering the social or contextual environment to which adolescents make decisions about sexual health (e.g., school settings). Given the prevalence of HIV among adolescents in high-income countries, implementing theater-based interventions in school settings would provide an opportunity to alter both the social and contextual environments, which according to SCT would lead to greater and more sustainable behavior change. Furthermore, inclusion of school settings would provide an opportunity for practitioners to consider the effects of district policy, school culture, and teacher attitude on intervention efficacy and scale-up efforts.

Theater-based interventions that used TRA/TPB emphasized the importance of having young actors deliver health messages, and depicted scenarios that resemble real-life adolescent experiences to shift beliefs about sexual norms and behaviors (Lieberman & Berlin, 2005; Lieberman et al., 2011). Specifically, these studies used theatrical productions to make desired behaviors such as delaying sex or consistent condom use socially acceptable, easy to do, and beneficial to one's health, while theater-based interventions informed by HBM aimed to increase perceived susceptibility and severity, and increase participants' perception of the benefits of taking action for their health (Glanz et al., 2008). Despite only one study (Lieberman et al., 2011) using HBM in this review, integrating this theory into theater-based approaches would be an efficacious next step for practitioners. Perhaps theater-based interventions could include narratives from other young adults focusing on adolescent susceptibility and severity to HIV.

Conduct Rigorous Evaluation

Previous literature reviews (Daykin et al., 2008; Joronen et al., 2008) that examined theater for health promotion across a variety of topics recommended the use of more rigorous evaluation designs to better understand the effects of theater-based interventions on actors and audiences. They also recommended the use of comparative effectiveness studies to determine whether theater-based interventions for health yield larger effects than standard health education practices (Daykin et al., 2008; Joronen et al., 2008). Our findings indicate that this recommendation has not been followed for theater-based HIV prevention interventions. The studies in this review rely heavily on cross-sectional quasi-experimental study designs, often with small sample sizes, no comparison group, or low retention rates,

preventing the establishment of internal and external validity. To increase the evidence in support of theater-based interventions, measuring multiple facets of change over time through the use of randomized, longitudinal study designs as well as the operationalization of key constructs and concepts unique to theater-based interventions are essential (Daykin et al., 2008; Joronen et al., 2008).

CONCLUSION AND IMPLICATIONS FOR PRACTICE

To develop a body of evidence supporting theater-based interventions for HIV prevention, it is imperative to more fully describe the theater approaches used in theater-based interventions. Without grounding interventions in a specific theatrical approach, there is little possibility of replicability, and furthermore no clear way to assess the mechanisms and pathways by which change may be occurring. Furthermore, the articles reviewed were all studies led by social/behavioral scientists, and it is unclear whether theater experts were included or consulted during the research process. The lack of descriptions of theatrical approaches or intervention components demonstrates areas that theater practitioners could address, making a significant contribution to understanding how these interventions work. We recommend rigorous evaluation and closer collaboration between behavioral scientists and theater practitioners.

Our systematic review yielded three recommendations (define and operationalize the theater approach guiding the intervention, ensure theater-based interventions are grounded in theory, and conduct rigorous evaluation), which were subsequently used to guide the adaptation, implementation, and evaluation of a theater-based sexual health intervention for adolescents called *AMP!* (Arts-based, Multiple-component, Peer education) in one North Carolina high school. *AMP!* is designed to change HIV knowledge and attitudes through lessons on general sexual health and HIV prevention, values clarification, partner communication, and problem-solving skills.

Define and Operationalize the Theater Approach Guiding the Intervention

Intervention content is delivered through three components: (1) theatrical performance delivered by undergraduate students, (2) interactive condom demonstration and negotiation skits delivered by undergraduate students, and (3) narrative and discussion with HIV-positive speakers. The first two components of the *AMP!* intervention are delivered by the “Sex-Ed Squad,” comprising undergraduate students enrolled in a service-learning course where they are trained in interactive theater and HIV prevention strategies. The content delivered is based on medically accurate knowledge as well as on the personal narratives and lived experiences of the undergraduate students and speakers and is, thus, a highly flexible and adaptable format. The specific techniques used are derived from Augusto Boal’s *Theater of the Oppressed* (Boal, 1979). TO techniques focus on transforming passive spectators into active “spect-actors” who use the theater as a “rehearsal for the revolution,” by imagining and practicing actions that might then be carried out in real life (Boal, 1979).

Ensure Theater-Based Interventions Are Grounded in Theory

The intervention was initially developed as an arts education tool by theater practitioners in partnership with the HIV Prevention Unit of the Los Angeles Unified School District in 2010. In preparing to adapt *AMP!* to North Carolina, the Los Angeles-based team partnered with adolescent and behavioral health researchers to redesign the intervention using best practices outlined by the CDC for school-based sexual health interventions (CDC, 2010a, 2010b). These practices include aligning intervention activities with community values and resources, pilot testing intervention components, using theory-driven intervention strategies, and using intervention methods that are age-appropriate and relevant to adolescent culture. Local school district administrators vetted the content to ensure alignment with the state's reproductive health unit. The planning phase for the intervention occurred over the course of 9 months, and the intervention was delivered simultaneously with standard health curriculum during a 4-week period.

Forming a transdisciplinary team to refine and evaluate the *AMP!* intervention in North Carolina began with acknowledging and valuing our diverse perspectives. It was essential for us to hire a local staff member specifically to facilitate this process, by translating concepts and issues between fields. Learning about the core theories from each other's fields and understanding how these theories complement each other, as well as how they may diverge, has allowed us to refine *AMP!* and facilitate dissemination and scale-up efforts.

Conduct Rigorous Evaluation

In addition to studying intervention outcomes based on the theoretical underpinnings of critical consciousness and transformation from TO (Grewe et al., 2015), *AMP!*'s efficacy has also been examined based on constructs from the TRA and SCT, focusing on changing attitudes, norms, and skills related to adolescent HIV/AIDS prevention. A full description of our study design and methods is reported elsewhere (Lightfoot et al., 2015) and outcomes measured included: increases in adolescents' level and retention of HIV knowledge and prevention strategies, attitudes about high-risk behaviors associated with HIV transmission, and reduced stigma toward PLWHA. Findings have shown statistically significant changes in HIV knowledge and attitudes toward safe sex and PLWHA for high school participants (Lightfoot et al., 2015). Qualitative findings for high school participants supported quantitative findings and indicated high participant satisfaction with the intervention (Lightfoot et al., 2015).

Results from two pilot evaluations and findings from this literature review are being used to guide the dissemination and comprehensive evaluation of *AMP!* to other school and community settings to reach adolescents. If we are committed to strengthening theater-based interventions, and the evidence in support of them, we must continue to engage theater practitioners as research colleagues and involve them in the development of conceptual models and theoretical frameworks and the interpretation of data.

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FIGURE 1.
Flow Diagram for Article Inclusion/Exclusion

TABLE 1**Theater-Based Approaches**

Approach	Description
Theater of the Oppressed (TO)	Techniques (image, forum, rainbow of desire, cops in the head) used to transform passive spectators into active “spectators” who use the theater as a “rehearsal for the revolution,” by imagining and practicing actions that may be carried out in real life (Boal, 1979)
Popular Theater	Techniques derived from TO used to explore conditions of concern, their origins and strategies for change (Conrad, 2004)
Process Drama	Techniques that invite participants to engage in complex issues, act out solutions, and come to experiential understandings of the world and their role in it (Simons, 2011)
Drama in Education	Activities or performance to engage children in exploring social, personal and health-related subjects typically described as “sensitive” (Joronen, Rankin, & Åstedt-Kurki, 2008)
Theater in Education	Involves a set of activities or a performance, usually devised around a topic relevant to a school curriculum that students observe and discuss (Joronen et al., 2008)

TABLE 2

Findings for the Theatrical and Behavioral Underpinnings of Interventions

Lead author and publication date	Theater approaches used	Behavioral frameworks and theories
1. Campbell (2009)	Arts-based health promotion; nonspecific	Information-motivation-behavior model
2. Causey (2012)	Edu-tainment	Theory of planned behavior; theory of reasoned action
3. Denman (1995)	Theater in Education	Unspecified
4. Elliott (1996)	Theater in Education	Unspecified
5. Guzmán (2003)	Educational theater; nonspecific	Behavioral ecological model (related to social cognitive theory)
6. Lieberman (2005)	Theater education; nonspecific	Social learning theory, health belief model, social inoculation theory
7. Lieberman (2011)	Educational theater; nonspecific	Theory of reasoned action; social cognitive theory
8. McDonald (2011)	Interactive Theater Education	Positive youth development
9. McEwan (1991)	Theater in Education	Unspecified
10. Ponzetti (2009)	Theater in Education and Popular Theater	Unspecified

TABLE 3

Summary and Quality Assessment of Studies

Lead author and publication date	Design and instruments	Participants and sample size	Random assignment	Attrition and follow-up data	Outcomes measured
Campbell (2009)	Preexperimental; mixed methods	79 students (13-16 years) from 7 local schools in the London borough of Newham were placed in two groups (Group 1 $n = 14$; Group 2 $n = 65$)	Participants not randomly assigned to either condition; self-selected into Group 1 (intervention + workshop) and Group 2 (intervention)	Group 1 response rate = 20%; Group 2 response rate = 26% to 32.5%; neither baseline (pretest) data nor follow-up data collected	Knowledge (condom use, sexually transmitted infections, HIV transmission), confidence/self-efficacy, HIV stigma, and HIV treatment
Causey (2012)	Prospective longitudinal quasi-experimental design	1,580 Latino middle school students at risk for teenage pregnancy and 970 parents	6 Los Angeles Unified School District middle schools randomly assigned to intervention and control conditions; control condition a nutrition and fitness program	6, 12, and 24 month follow-up; students in intervention condition attended 65% of sessions offered; parents attended 34% of family events	Parent-child communication, sexual health and abstinence beliefs, attitudes, and behaviors
Denman (1995)	Quasi-experimental pre-/posttest design with unequal comparison groups; focus groups	680 students (252 intervention; 428 control); participants recruited from 16 Nottinghamshire schools	Classrooms randomized at school level and assigned to condition	91% response rate in intervention group; 81% response rate in control group; focus groups conducted following intervention	Knowledge (HIV transmission and condom use) and attitudes (HIV stigma, risk behaviors, protective behaviors); focus group data probed for program acceptability
Elliott (1996)	Quasi-experimental pre-/posttest design	132 students attended the performance and 85 attended standard educational seminars	Randomly selected 10 schools to participate and randomly assigned them to condition	42 of the theater group (32%) and 35 of the seminar group (27%) completed all assessments; 2-month follow-up assessment; some students participated in a focus group	Knowledge (HIV transmission and condom use), attitudes (HIV stigma, self-efficacy, and protective behaviors) and behaviors (sexual activity and condom use)
Guzmán (2003)	Quasi-experimental pre-/posttest design with unequal comparison group	1,618 eighth- and ninth-grade students (ages 11-18) from 7 Southern California schools attended performances	Convenience sample; schools in which school board and principal gave permission participated	961 (59%) completed both pre- and posttests; 59.6% of pretest and posttests were successfully matched; no follow-up	Knowledge (HIV transmission, abstinence, and male responsibility), birth control beliefs, sexual health communication, and behaviors (sexual activity, contraceptive use, and delayed intercourse)
Lieberman (2005)	Quasi-experimental pre-/posttest design with unequal comparison group	329 fifth- and sixth-grade students received the intervention; 116 students served as a comparison group	No random assignment	92.6% completed both pre- and posttests; slightly higher retention in intervention group; no follow-up	Knowledge (puberty, abstinence and pregnancy prevention), attitudes/beliefs (sexual activity, abstinence, teen pregnancy), intentions (sexual activity) and self-efficacy (communication with parents and abstinence)
Lieberman (2011)	Quasi-experimental pre-/posttest design with unequal comparison group	1,443 fifth- and sixth-grade students from 61 schools participated; 896 students from 9 schools participated in	No random assignment	78.9% of participants completed both pre- and posttests; no follow-up	Knowledge (puberty, sex, abstinence), sexual health intentions, self-efficacy, pro-abstinence attitudes, parent-child communication, and desire to be a

Lead author and publication date	Design and instruments	Participants and sample size	Random assignment	Attrition and follow-up data	Outcomes measured
		intervention group; 247 students from 7 schools participated in comparison group			teen parent
McDonald (2011)	Quasi-experimental pre-/posttest with follow-up focus group	194 students from alternative high schools in a major metropolitan area of Southwestern United States participated	Participants not randomly assigned to condition; they chose to participate in this elective	77% of participants completed both pre- and posttests; a small number of participants also participated in a focus group	Knowledge (sexual risk, pregnancy, sexually transmitted diseases, dating violence, substance use), risk avoidance skills, positive characteristics (self-esteem, self-efficacy, coping skills, empathy, and sense of control over one's future) and interpersonal relationships (parent, peer, and dating)
McEwan (1991)	Preexperimental pre-/posttest design with focus groups	140 student from schools and youth clubs in northeast England; 100 students completed surveys only; 40 students completed focus group only	No random assignment	58% completed both pre-and posttests; a small number of participants also participated in a focus group	Knowledge (HIV transmission), attitudes (gender equality, self-determination, perceived risk), intended behavior (condom use and sexual activity)
Ponzetti (2009)	Preexperimental pre-/posttest design; qualitative interviews as follow-up	627 ninth-grade students ages 13 to 16 divided into three groups	No random assignment; Group 1 attended the play and workshop ($n = 310$); Group 2 attended the play but not the workshop ($n = 138$); Group 3: did not see the play or attend the workshop ($n = 138$)	91% response rate at posttest; qualitative interviews as follow-up	Attitudes/beliefs (sexual relationships), embarrassment related to sexual issues, sexual health communication, sexual self-efficacy, and identifying and exercising sexual limits/boundaries