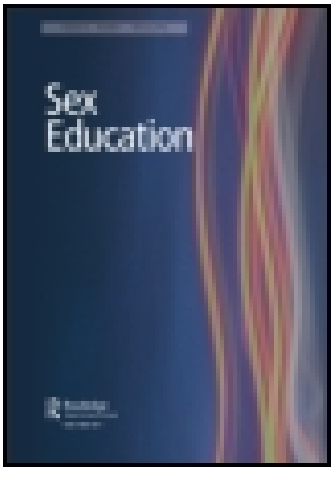

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'I learned to be okay with talking about sex and safety': assessing the efficacy of a theatre-based HIV prevention approach for adolescents in North Carolina

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'I learned to be okay with talking about sex and safety': assessing the efficacy of a theatre-based HIV prevention approach for adolescents in North Carolina

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Adolescents are at increased risk of HIV and sexually transmitted infections (STIs) in the Southern states of the USA, where rates among youth are higher than in the rest of the nation. This paper reports on findings from a pilot study of an HIV prevention intervention that uses interactive theatre to educate young people about sexual health. The intervention was developed in Los Angeles and adapted for testing in the Southern USA, with its legacy of abstinence-based approaches to sexual health education. This study assessed intervention effects among a sample of young people in two public high schools in North Carolina. We used a pre-test, post-test quasi-experimental evaluation design to assess changes in 317 ninth-grade participants' knowledge and attitudes about HIV. At post-test, we found statistically significant increases in participants' HIV knowledge ($t = 60.14$; $p = 0.001$), as well as changes in attitudes ($\chi^2 = 8.23$; $p = 0.042$) and awareness ($\chi^2 = 4.94$; $p = 0.026$). Focus group data corroborated an increase in HIV knowledge and a reduction in HIV stigma as successful outcomes of intervention participation. The findings make an important contribution to the literature on theatre-based interventions for sexual health education. Furthermore, they highlight the importance of considering sociocultural and political context in implementing HIV prevention interventions in schools.

Keywords: HIV prevention; adolescents; sex education; theatre-based intervention; USA

Introduction

The face of HIV and other sexually transmitted infections (STIs) in the USA has grown more youthful with young adults aged 13–29 years accounting for 39% of new HIV infections in 2009 (Centers for Disease Control and Prevention [CDC] 2012). The US South is disproportionately affected by HIV with half of all new infections in 2009 being reported among people living there (CDC 2011). In the south-eastern state of North Carolina (NC), the proportion of reported HIV cases among young people aged 13–24 years has increased from 6% to 23% of all reports from 2007 to 2011 (North Carolina Department of Health and Human Services 2012). Evidence from the US CDC's (2013) Youth Risk Behavior Survey (YRBS) indicates that young people in NC

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engage in more risky sexual behaviour than the national average. According to the YRBS, 7% of all high school students in NC reported having had sex for the first time at the age of 13 or younger, 15% of students had had sex with four or more partners, 32% were currently sexually active and over 39% of these reported not using a condom during last sexual intercourse (CDC 2013). The increase in HIV combined with high-risk sexual activity warrants amplified efforts to address HIV prevention with young people in NC.

To reduce the risk of HIV, it is critical to develop innovative prevention strategies to educate youth in medically accurate, age-appropriate, meaningful, culturally relevant and effective ways while simultaneously considering the sociocultural and political context of communities. *AMP!* (*A*rts-based, *M*ultiple intervention, *P*eer-education) is a sexual health education and HIV prevention approach developed through a collaboration between the Los Angeles Unified School District's HIV Prevention programme and the University of California at Los Angeles's (UCLA) Art & Global Health Center. The goal of *AMP!* is to supplement the sexual education content offered within school settings to increase teenagers' level and retention of HIV-related knowledge and prevention strategies, inform them about high-risk behaviours associated with HIV transmission and reduce stigma towards people living with HIV. *AMP!* provides young people with crucial information and prevention strategies in a novel way – through theatre-based performances and workshops developed and delivered by 'near peer' undergraduate students enrolled in a local university course in which they are trained in HIV, health education and interactive theatre techniques.

AMP!'s intervention strategy is based on the pioneering work of Brazilian thinker Augusto Boal, who used his Theatre of the Oppressed as a platform to engage participants in exploring solutions to complex social problems and prepare for social change (2000). Boal sought to break down barriers between spectators and the dramatic action of performance. To do this, he created techniques that empower spectators to play a part in the drama by directing the action, suggesting solutions to conflict, replacing characters in the action or having dialogue with characters about their motivations (Boal 2000). Public health specialists have applied Boal's approach as a strategy to increase awareness and provide a mechanism for intervention participants to rehearse changes in health behaviour (Belknap et al. 2013; Conrad 2008; Francis 2011; Schaedler 2010). Theatre-based interventions have been applied to a wide range of public health problems (Daykin et al. 2008; Joronen, Rankin, and Åstedt-Kurki 2008), including teenage dating violence (Belknap et al. 2013), substance abuse (Guttman, Gesser-Edelsburg, and Israelashvili 2008; Stephens-Hernandez et al. 2007) and obesity (Haines, Neumark-Sztainer, and Morris 2008), as well as HIV prevention and sexual health promotion (Glik et al. 2002; Simons 2011).

AMP! uses Boalian techniques to create scenarios based on undergraduate students' real-life experiences, to provide ninth-grade high school students with a platform through which to gain sexual health knowledge, practise decision-making and build skills to help them navigate adolescent sexuality and HIV/STI-related risk. After five years of developing the model in Los Angeles, *AMP!* recently expanded to the US South, a region that has higher rates of STIs, including HIV, than the rest of the nation (Djamba, Davidson, and Aga 2012). Los Angeles-based colleagues developed a partnership with the University of North Carolina at Chapel Hill (UNC) to pilot the intervention in one local school district and evaluate its impact as an HIV prevention strategy for participants in a Southern US context, with careful consideration of the political and sociocultural factors at play.

Background

Developing a theatre-based HIV intervention for delivery in NC schools is both innovative and challenging, given the legacy of abstinence-only sex education policies in the US South (Bach 2006). In NC, the School Health Education Act was passed in 1996 requiring schools to teach an abstinence-only-until-marriage curriculum, permitting comprehensive sex education only after the local boards of education had first conducted public hearings and a review of education materials (School Health Education Act 1995). As a result of the law's enactment, 100 out of 117 local education agencies in the state selected to implement abstinence-only programmes (Bach 2006).

Research has shown, however, that abstinence-only programmes are ineffective in reducing STIs, delaying age at first sex and reducing teenage pregnancy (Kohler, Manhart, and Lafferty 2008; Trenholm et al. 2007). In NC, while the official policy supported abstinence-only approaches, a parent opinion poll on youth sex education conducted in 2003 indicated strong support for comprehensive sexual health education (Ito et al. 2006). In that survey, 91.8% of parents polled thought comprehensive sex education should be taught in public schools, over 95% felt that transmission and prevention of STIs, including HIV, should be included in the curriculum and 76.7% believed classroom demonstrations of how to correctly use a condom are important (Ito et al. 2006).

Framed by this contrast between state policy and parental preference, the Healthy Youth North Carolina Coalition was formed to advocate for comprehensive sex education in all public schools, and in 2009 the Healthy Youth Act was passed. The Act paved the way for more expansive 'abstinence-based comprehensive sexuality health education' (Healthy Youth Act 2009) incorporating evidence and best practices from public health research to meet student needs and parent preferences (Adolescent Pregnancy Prevention Campaign of North Carolina 2009). The state's Department of Public Instruction's Healthful Living Curriculum now provides comprehensive sexual health content for school district use through its Reproductive Health and Safety Unit (North Carolina Department of Public Instruction 2012). Yet the implementation of sexual health education varies widely across NC districts with many still operating from an abstinence-only framework. Given this context for sexual education in the state, it was essential to gain buy-in from school system stakeholders (administrators, teachers and parents) to successfully implement the intervention, and we purposefully sought out a school district that had a history of promoting comprehensive sexual health education in which to pilot and test *AMP!*'s innovative approach.

Despite the widespread use of theatre-based interventions as a public health strategy, few of these interventions have been delivered and evaluated for effectiveness in the USA (Daykin et al. 2008; Glik et al. 2002; Joronen, Rankin, and Åstedt-Kurki 2008; Simons 2011). This paper reports on evaluation findings related to *AMP!*'s impact on high school student participants' knowledge and attitudes about HIV and AIDS and discusses implications for further expansion and evaluation of this approach.

Methods

Design

This pilot study focused on assessing the efficacy of *AMP!* for ninth-grade programme participants. The study used a pre-test, post-test quasi-experimental evaluation design to

evaluate changes in high school participants' knowledge and attitudes about HIV and AIDS. We collected both quantitative and qualitative data, with surveys administered pre- and post-intervention and focus groups conducted with a subset of participants after each *AMP!* component. The research protocol was approved by the UNC Institutional Review Board (IRB).

Sample and protection of human subjects

Two high schools with comparable demographic characteristics were identified by the health coordinator of the school district in which the study took place. One was selected to receive the intervention and the other school was designated as the control. In total, 317 ninth-grade students were enrolled in the study. Detailed demographics of the study sample can be found in Table 4. Recruitment procedures were identical at both sites. The research coordinator visited all ninth-grade health classes at participating schools, described the programme to students and distributed an information packet about *AMP!* Students at both intervention and control schools whose parents signed the IRB-approved consent forms and who provided their own assent were eligible to participate in the study. Young people received no compensation for their participation in the study. Those at the intervention school ($N = 6$) participated in focus groups and were provided with lunch. No names were collected on the surveys or during the focus group discussions to ensure data confidentiality and privacy of participants.

Intervention

The *AMP!* intervention consisted of three components delivered to students in ninth-grade health classes at the intervention school: (1) Sex Ed Squad Performance developed and delivered by undergraduate students; (2) Condom Demonstration and Negotiation Workshop facilitated by the undergraduate students; and (3) Interactive presentation and discussion facilitated by people living with HIV. The performance and workshop scenarios, designed to amplify the school curriculum, were based on undergraduates' lived experiences and the questions and challenges they encountered navigating sexual health as high school students, largely in abstinence-only classrooms in the South. The theatre performance built on experiences familiar to high school-aged youth, such as awkward discussions with parents, partners who want to have sex without protection and teachers in health classes who avoided any talk of sex or simply say 'don't do it'. The performance adapted popular songs, social media and television shows well known to young people to convey relevant messages about safe sex, HIV prevention, condom negotiation and sexual health using mediums that were lively, entertaining, memorable and accessible. Examples of the topics addressed and excerpts from the performance are shown in Table 1.

The school district vetted the programme to ensure alignment with NC Department of Public Instruction's Reproductive Health and Safety Unit curriculum's essential standards (see Table 2). The intervention school received all three *AMP!* components in addition to the standard curriculum from the Reproductive Health and Safety Unit; the control school received the standard curriculum.

Table 1. Performance themes and excerpts.

Theme	Performance description	Excerpt from script
HIV 101	Undergraduate students lead the high school students in a call and response singing the five fluids of HIV transmission	Conductor: ladies and gentleman, the [university] sexaphonic choir is here to teach you the five fluids of HIV transmission: blood, semen, pre-cum, vaginal fluid, breast milk
Stigma	An episode from *The Real World* with an HIV-positive participant in the household	Housemate 1: how am I supposed to be comfortable in this house when someone is running around with HIV or AIDS or whatever. Now I can't go barefoot, I can't sit on the toilet, I need to buy my own mini fridge to keep food in case he touches the food Housemate 2: how am I supposed to pretend to agree with this chick? Everything she is saying is wrong .... I know she doesn't know any better, but seriously?? She can't go barefoot in the house ...? Now that's just being an overdramatic diva. He is a normal guy, she needs to get over herself
Condom use and testing	A sportscaster-inspired scene with two announcers commenting as two teenagers initiate sex in a car. The sportscasters 'pause the play', drawing attention to issues of consent and condom use	Young person 1: so, do you um ... have protection? Young person 2: ya, I brought a condom, don't worry! (takes a look at date) 2015? Phew, we're good Young person 1: (rips with teeth, freezes with teeth on wrapper) ..... Sportscaster 1: I'm seeing teeth on the condom. Yup. I'm seeing teeth on the condom Sportscaster 2: that's a silly mistake, and one that you'd think the coaches would drill into their team, so it's very surprising this happened Sportscaster 1: it just shows that even with a lot of experience and practice, players can still make these simple mistakes and it can potentially cost them the game

Source: Adapted from Grewe et al. (2015).

Measures

The survey instrument for the pilot study comprised several question types and responses including multiple choice, dichotomous and four-point Likert scale. The survey asked students about their level and quality of knowledge about HIV and AIDS (facts and transmission); attitudes towards engaging in high-risk behaviours associated with HIV transmission; attitudes towards seeking testing and counselling for HIV; and attitudes towards people living with HIV. Individual behaviours related to sexuality, sexual practice, sexual and reproductive health, and risk behaviours associated with acquiring HIV such as substance use/abuse were also assessed. The measures included items from the CDC's YRBS (Brener et al. 2004), the World Health Organization's knowledge, attitudes and practices survey instrument for adolescents (World Health Organization 1989) and the Towards a Healthy Tomorrow survey (Stanton et al. 1998). All of these measures are reliable and valid for adolescents. The YRBS assesses individual risk behaviours including substance use and sexual practices and behaviours. The items from the World Health Organization survey assess attitudes about engaging in high-risk

Table 2. Intervention component and alignment with curriculum standards.

Intervention component and description	Alignment with NC Department of Public Instruction Reproductive Health and Safety Unit curriculum's essential standards
Sex Ed Squad Theatre Performance 30 minute show for ninth-grade high school students in Health classes developed and delivered by undergraduate students weaving together humour, personal narrative and medically accurate information to promote HIV prevention knowledge and strategies	Personal and consumer health (PCH) Essential standard: 9. PCH.1. Analyse wellness, disease prevention and recognition of symptoms Clarifying objectives: • 9. PCH.1.1. Recognise that individuals have some control over risks for communicable and chronic diseases • 9. PCH.1.3. Explain the procedures for health screenings, check-ups and other early detection measures in terms of their health-related benefits Essential standard: 9. PCH.2. Evaluate health information and products Clarifying objective: • 9.PCH.2.2. Monitor the effects of media and popular culture on normative beliefs that contradict scientific research on health
Post-performance interactive question and answer session where high school students could ask undergraduate performers about the scenarios	Interpersonal communication and relationships (ICR) Essential standard: 9. ICR.1. Understand healthy and effective interpersonal communication and relationships Clarifying objective: • 9. ICR.1.4. Summarise principles of healthy dating Essential standard: 9. ICR.2. Evaluate abstinence from sexual intercourse as a positive choice for young people Clarifying objectives: • 9. ICR.2.1. Critique skills and strategies that are used to promote abstinence from sexual activity in terms of their effectiveness • 9. ICR.2.2. Explain the consequences of early and unprotected sexual behaviours
Condom Demonstration and Negotiation Workshop An interactive forum theatre workshop facilitated by undergraduate university students to teach high school students about how to properly use a condom, negotiate using condoms with a potential partner or discuss condom use with a parent	Interpersonal communication and relationships Essential standard: 9. ICR.1. Understand healthy and effective interpersonal communication and relationships Clarifying objective: • 9. ICR.1.4. Summarise principles of healthy dating Essential standard: 9. ICR.2. Evaluate abstinence from sexual intercourse as a positive choice for young people Clarifying objectives: • 9. ICR.2.1. Critique skills and strategies that are used to promote abstinence from sexual activity in terms of their effectiveness

(*Continued*)

Table 2. *(Continued)*.

Intervention component and description	Alignment with NC Department of Public Instruction Reproductive Health and Safety Unit curriculum's essential standards
	• 9. ICR.2.2. Explain the consequences of early and unprotected sexual behaviours Essential standard: 9. ICR.3. Create strategies that develop and maintain reproductive and sexual health Clarifying objectives: • 9. ICR.3.3. Illustrate skills related to safe and effective use of methods to prevent STIs, as well as access resources for testing and treatment • 9. ICR.3.4. Exemplify decision-making skills and problem solving regarding safe and effective use of methods to prevent unintended pregnancy
HIV-positive speakers HIV-positive advocates visited intervention school classrooms to share personal stories of what it is like to live with HIV, how/when they learned about their diagnoses, behaviours that put them at risk, issues of disclosure and medication routines	Personal and consumer health Essential standard: 9. PCH.1. Analyse wellness, disease prevention and recognition of symptoms Clarifying objective: • 9.PCH.1.7. Differentiate between the lifelong effects of positive and negative health behaviours Interpersonal communication and relationships Essential standard: 9. ICR.1. Understand healthy and effective interpersonal communication and relationships Clarifying objective: 9.ICR.1.1. Illustrate the ability to respond to others with empathy

behaviours associated with HIV transmission (e.g. substance use while engaging in sex, not using condoms, etc.). Items from the Towards a Healthy Tomorrow instrument assess HIV-related knowledge, attitudes towards people living with HIV and safe sex practices. Table 3 shows the specific survey items used in the analyses presented in the results section. The survey also captured student demographic characteristics including race/ethnicity, gender, socio-economic status and sexual orientation.

Focus group guides were adapted from the UCLA-sponsored *AMP!* programme for the NC context. The guides contained questions designed to assess strengths and weaknesses of intervention components, relatability, HIV-related knowledge and skills gained, and perceived changes in knowledge, communication, attitude and behaviour.

Data collection

The web-based survey was administered by study personnel on school computers at control and intervention schools to students who had parental consent and provided assent. Using computer-assisted methods of data collection to obtain sensitive information such as risk behaviour and sexual activity has been found to be non-threatening and accepted by adolescents (Gutierrez and Torres-Pereda 2009). The survey administration schedule was

Table 3. Survey items on HIV-related knowledge, HIV-related attitudes and safe sex.

HIV/AIDS knowledge
1. HIV is the virus that leads to AIDS
2. HIV can be transmitted through blood
3. HIV can be transmitted through pre-cum
4. HIV can be transmitted through semen
5. HIV can be transmitted through vaginal fluids
6. HIV can be transmitted through breast milk
7. HIV can be transmitted through saliva
8. HIV can be transmitted through touching
9. HIV can be prevented by wearing a condom during sex
10. I know where to get an HIV test
HIV/AIDS attitudes and safe sex
1. I am familiar with how I can affect international HIV/AIDS policy issues as a student
2. I am familiar with HIV/AIDS treatment available to people within the USA
3. I am likely to use condoms or latex barriers with my partner when I have sex
4. I feel confident discussing safer sex with my partner

Source: World Health Organization (1989) and Stanton et al. (1998).

designed to collect data immediately prior to and directly after students received the Reproductive Health and Safety Unit at the control school and the Unit plus *AMP!* at the intervention school. Pre- and post-intervention surveys were matched using a unique identifier.

Four focus groups were conducted at the intervention school: one following each of the three *AMP!* components and one after the programme concluded. The focus groups were conducted during the school lunch period in an on-site private conference room. Six high school students participated in the focus groups: two White young women, two Black young women and two Black young men. The audio recordings were transcribed verbatim for further analysis.

Data analysis

Survey data were analysed using SAS 9.3 software (SAS Institute 2011). Descriptive statistics were calculated on pre-test responses to summarise demographic variables, sexual experience, and drug and alcohol use. A significance level of $p \leq 0.10$ was used to assess differences between study conditions at baseline using independent *t*-tests and χ^2 analyses. None of the variables tested resulted in statistically significant differences between the two study conditions. Intervention students were members of four different ninth-grade health classrooms. Classroom membership was a categorical variable used to identify which classroom participants were in at the intervention school. The classroom variable was recoded to reflect the different categories or classrooms. The recoded (i.e. contrast coded) classroom variables were entered into the models as fixed, non-random, effects to determine if there were any classroom-level differences at baseline. The parameters for our contrasts were not statistically significant and were not included in our final models.

Intervention effects were examined using χ^2 tests to assess differences between control and intervention conditions in the trend in ordinal response and small count data, and analysis of variance (ANOVA) was used for continuous outcomes. Post-test changes in HIV-related attitudes were analysed using the Mantel–Haenszel χ^2 test to determine if there was a significant difference between the control and intervention conditions in the trend of

ordinal responses. Statistical analyses were performed only on pre-specified hypotheses using an intent-to-treat protocol, in which analyses of the results of the intervention were based on the initial intervention assignment and not on the intervention components eventually received. A significance level of $p \leq 0.05$ was used to assess intervention effects.

Among the 317 participants completing pre-intervention surveys, 300 (94.6%) were available to complete the post-intervention assessment. Attrition analyses indicated no difference between those students completing the post-intervention survey and those unavailable for post-intervention assessment.

All focus groups were digitally recorded, transcribed and uploaded into Atlas.ti v6.2 (Scientific Software Development 2010), a qualitative data management and software package. Research staff used thematic analysis (Gibbs 2008) to develop a codebook with a-priori and inductive codes. Two members of the research team independently coded one focus group and convened to compare assigned codes to ensure inter-coder agreement (Gibbs 2008) and refine the codebook. The two coders independently coded the remaining transcripts and reconvened to resolve any coding disagreements in order to ensure high-percentage agreement between coded sections (Kappa statistic ≥ 0.90). Coded data were grouped into themes to explicate upon quantitative findings on intervention effect.

Results

Participant demographic characteristics

A total of 317 ninth-grade students participated in the study (Table 4). Approximately 67% self-identified as White, 10% as Black, 8% as Hispanic or Latino, and 20% as Asian. Forty-three percent were male, 54% were female and 3% refused to answer. The majority

Table 4. Participants' demographic characteristics, by intervention condition.

	Control condition ($n = 169$) *N* (%)	Intervention condition ($n = 148$) *N* (%)	χ^2 test (*p*)
Race/ethnicity			0.695 (0.4044)
Asian	50 (29.94%)	16 (11.51%)	
Black or African-American	14 (8.38%)	17 (12.23%)	
White or Caucasian	105 (62.87%)	98 (70.50%)	
Hispanic or Latino	15 (9.04%)	10 (7.25%)	
Gender			0.466 (0.7920)
Male	68 (41.21%)	62 (44.60%)	
Female	93 (56.36%)	73 (52.52%)	
Socioeconomic status			0.319 (0.8527)
Qualify for free/reduced lunch	23 (14.02%)	22 (15.71%)	
Sexual orientation			6.750 (0.2399)
Straight/heterosexual	149 (90.30%)	127 (90.71%)	
Gay/homosexual	0 (0.00%)	2 (1.43%)	
Bisexual	6 (3.64%)	1 (0.71%)	
Lesbian	1 (0.61%)	1 (0.71%)	
Other	1 (0.61%)	5 (3.57%)	
Sexual behaviours			3.461 (0.1772)
Ever had sexual intercourse	18 (10.65%)	21 (14.89%)	

(87%) identified as being straight or heterosexual, 5% gay or homosexual, bisexual, lesbian or other and 24 participants (8%) refused to answer.

With regard to sexual behaviours, 39 participants (13%) reported having had experienced sexual intercourse, defined as having oral, anal or vaginal sex. Of these 39, 41% reported not using a condom at last intercourse, which is slightly higher than the national rate of 37% for ninth graders (CDC 2013). There were no significant differences in socio-demographic characteristics, sexual behaviours, HIV-related knowledge, or drug and alcohol use across the control ($n = 169$) or intervention ($n = 148$) conditions.

Intervention effects

Quantitative and qualitative analyses revealed two primary themes that characterised intervention effects on knowledge and attitudes.

Change in HIV-related knowledge: the 'boogie man' effect

Post-intervention, participants reported higher HIV-related knowledge scores (Table 5). The intervention condition had a higher difference in their HIV-related knowledge score relative to the control condition: 1.89 to 1.31, respectively. Using a subset of surveys with matching pre-test and post-test identification numbers, *t*-tests confirmed that the change in pre-test and post-test HIV-related knowledge scores between the intervention and control groups was statistically significant ($t = 60.14$; $p = 0.001$).

Focus group data supported these quantitative results. The 'boogie man' effect highlights the salient theme expressed across focus group participants of having inaccurate knowledge or not enough accurate knowledge about HIV transmission and prevention. As one participant described:

> Well, a lot of people say 'oh, don't do this, don't do that, you'll contract AIDS' or whatever it is that they believe … and they'll threaten you with it. So it becomes kind of a 'don't let the boogie man get you'.

Participants pointed out that thinking of HIV as the 'boogie man' was one of many socially constructed myths about the disease, and they discussed how the *AMP!* intervention caused them to question how much they knew about HIV. As one participant described it, prior to the intervention he thought HIV was a 'mystery disease' or 'ghost thing' that did not affect young people. Another described the stigmatising attitudes about HIV that pervade society: 'Because of our [social] culture, we think HIV, we think they did something nasty to get HIV.' Another participant agreed with this point and went on to say, '[Pre-intervention] someone having AIDS or HIV, I eventually thought it would turn into AIDS which they, of course, would die.' Post-intervention, participants recognised how inaccurate knowledge about HIV and AIDS can be used to instil fear and perpetuate myths about the disease and acknowledged that their understanding of HIV had changed as a result of their participation in *AMP!* Both quantitative and qualitative findings

Table 5. Effects of the intervention on mean HIV-related knowledge score.

Control		Intervention	
Pre ($N = 169$)	Post ($N = 167$)	Pre ($N = 148$)	Post ($N = 133$)
Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)
7.33 (7.05, 7.60)	8.64 (8.40, 8.89)	7.08 (6.82, 7.35)	8.97 (8.75, 9.19)

corroborated the intervention effect on participants' recognising inaccurate information and increasing basic HIV-related knowledge.

Change in attitudes: 'it really opened up my eyes'

At baseline, there was no significant difference between the control and intervention conditions on responses to items measuring HIV-related attitudes. There was a trend towards agreeing more with the statements 'I am familiar with how I can affect international HIV/AIDS policy issues as a student' ($\chi^2 = 8.23$; $p = 0.042$) and 'I am familiar with HIV/AIDS treatment available to people within the United States' ($\chi^2 = 4.94$; $p = 0.026$) at post-test among those in the intervention group, relative to the control group, indicating a change in HIV-related attitudes. Among sexually active participants, there was a trend towards agreeing more with the statements 'I am likely to use condoms or latex barriers with my partner when I have sex' ($\chi^2 = 8.42$; $p = 0.004$) and 'I feel confident discussing safer sex with my partner' ($\chi^2 = 8.15$; $p = 0.003$) at post-intervention assessment among those in the intervention group, relative to the control group.

Our analysis of the qualitative data also revealed an attitudinal shift in participants' perceptions of HIV-related stigma, condom use and partner communication. The theme 'It really opened up my eyes' reflects this change. Post-intervention participants explained they felt more aware of the difficulty of disclosing disease status to family and friends, different modes of HIV transmission and the clinical treatment options available to people living with HIV. One participant said:

> It [the intervention] really opened up my eyes because we always talked about HIV and stuff [in class], [but] we've never had like speakers and stuff … It was just really different and so it will always be in my mind and stuff about it ….

Another informant stated that participating in the intervention made it easier for them to communicate about HIV prevention: 'I learned to be okay with talking about sex and safety.' Others said that participating in the intervention gave them an opportunity to address misperceptions about people living with HIV and better understand their susceptibility to HIV:

> I know that anyone can get HIV … But to me, it seemed a lot scarier to see someone who's completely healthy who had lived an absolutely normal life, telling that he was HIV-positive because it kinda makes it more real that absolutely anyone can get it, and it doesn't matter who you are. It doesn't matter your sexual orientation. It doesn't matter, you know, if you've gotten into college, if you have a Master's degree … It doesn't matter. You can get HIV.

Discussion

This paper reports on an assessment of the efficacy of *AMP!* for ninth-grade programme participants in an NC school district, where innovation is imperative to address the legacy of abstinence-based approaches to sexual health education. Quantitative and qualitative results present evidence of efficacy; the intervention achieved statistically significant outcomes in terms of increased student knowledge and showed evidence of attitudinal shift in participants' perceptions of HIV-related stigma, condom use and partner communication. In addition, qualitative findings suggest that the *AMP!* approach was seen as an innovative and effective way for young people to learn about sexual health.

While most survey participants indicated that they had been taught about HIV in school (86%), the content of what they had been taught in their health classes was not

captured through our quantitative data collection process. However, focus group data provided insight into what was *not* covered in the sexual health education delivered in the students' classes and how the intervention amplified the content delivered by classroom teachers. Participants said that, while they had discussed HIV in their health classes, lessons were not delivered in a comprehensive or memorable way. The *AMP!* intervention had provided them with an interactive and 'humorous' approach to sexual health education, in contrast to the traditional classroom method of 'worksheets' and 'lectures'. Other participants stated that they preferred the intervention to their previous sexual health education because it felt more 'real' to their experiences and relevant to their lives, the pressures they faced and the situations they encountered.

The intervention's incorporation of humour, language, song and social media tools familiar to young people, its use of dramatic scenarios derived from near peers' actual experiences and its practical messages about how to 'be smart' about sex resonated with participants. These intervention components underscore the importance of finding culturally relevant, age-appropriate, context-attuned ways to educate high school students about sexual health and HIV prevention beyond in-class lectures and worksheets.

Our pilot findings support those of previous studies of HIV prevention interventions developed for diverse cultural and geographic settings which suggest that addressing norms, teaching skills and using creative activities enhance information retention and attitudinal change, which may result in subsequent reductions of sexual risk behaviours (Campbell et al. 2009; Coyle et al. 2004, 2006). Findings from this study also strengthen the evidence for interactive theatre-based HIV prevention as an effective and memorable way to deliver sexual health information, increase HIV knowledge, disseminate HIV prevention strategies and bring about changes in attitudes (Conrad 2008; Francis 2011; Schaedler 2010). The pilot's findings signify receptiveness among stakeholders to innovative methods of delivering sexual health information in contexts such as NC, where educators and advocates may struggle to find ways to provide key messages of comprehensive sexual health given the prevailing sociopolitical climate. Finally, our findings speak to the potential of peer health education as a strategy to increase HIV and sexual health knowledge (Mahat et al. 2008) and a means of opening discussion with near peers and demystifying culturally 'taboo' topics (such as condom demonstrations and partner communication and negotiations about condom use), all of which are essential to comprehensive sex education.

The literature on theatre-based HIV prevention interventions points to the need for expanded evaluation research (Daykin et al. 2008; Glik et al. 2002; Joronen, Rankin, and Åstedt-Kurki 2008; Simons 2011) but provides little detail on how research design or instruments could be strengthened. Our findings point to recommendations to enhance intervention effectiveness and the future measurement validity, reliability and generalisability. For example, studies similar to ours, which rely on self-reports to assess HIV knowledge, attitudes and sexual behaviours, could in future include a measure for social desirability to help determine if respondents under-report 'unacceptable' behaviours and over-report those that are more socially acceptable. Alternatively, audio computer-assisted self-interviewing (ACASI) might be used for data collection, which has been shown to support more accurate reporting of sexual behaviours as compared to other data collection methods (Gutierrez and Torres-Pereda 2009; Morrison-Beedy, Carey, and Tu 2006; Tourangeau and Smith 1998). Other recommendations include adding scales that have been tested and validated with diverse populations to measure intervention effects beyond changes in HIV-related knowledge and attitudes, such as condom use self-efficacy scale (CUSES) (Baele, Dusseldorp, and Maes 2001; Brafford and Beck 1991) and partner communication scale (PCS) (Milhausen et al. 2007; Shoop and Davidson 1994). Finally, our results point to the

importance of enhancing measurement of HIV stigma constructs. HIV stigma scales that have been developed for the general population have not to date been rigorously tested with adolescent populations. Moreover, many of the scales available for measuring adolescent HIV stigma have been developed and validated exclusively for use with HIV-positive young people and are not designed to measure how the broader youth population conceptualises HIV-related stigma (Quinn and Chaudoir 2009; Swendeman et al. 2006; Wright et al. 2007).

There are several limitations to the study. First, the intervention was conducted using a convenience sample of two public high schools from the same school district. Recruiting a more heterogeneous sample of schools from other districts might provide different results that would question the generalisability of the intervention. Second, the qualitative findings were based on a very small sample of students ($N = 6$) who elected to participate in the focus groups. Third, it was not possible to assess the longer-term intervention effects within the short time frame of the pilot programme. In future studies, we will expand the time frame to assess intervention effects at three or six months post-intervention. Fourth, results indicated that HIV-related knowledge increased among both the intervention and control conditions. Given that *AMP!* was designed to supplement and enhance pre-existing sexual health education, we suspect that the pre-test may have influenced the uptake of the standard curriculum of the Reproductive Health and Safety Unit among control participants and further sensitised them to the post-test. Despite these limitations, the primary goal of assessing the efficacy of the programme for high school students was achieved and results were promising, laying the groundwork for a future effectiveness trial.

Conclusion

The rising HIV incidence among young people, along with the legacy of abstinence-only policies and programmes in NC, calls out for innovative, context-specific and effective medically accurate strategies for sexual health education and HIV prevention. Theatre-based approaches have been applied in diverse settings and to a myriad of health issues; however, a gap remains in the evaluation of such methods. The promising results of this pilot study in the culturally conservative political environment of the US South provide a significant contribution to the literature on theatre-based interventions for adolescent sexual health education and HIV prevention. *AMP!*'s approach to HIV prevention and use of creative, memorable and culturally relevant methods to engage students has the potential to impact on adolescent HIV-related knowledge, attitudes and risk behaviour, as well as effect behaviour change. The findings point to clear opportunities for intervention scale up, as well as the need for expanded research on theatre-based interventions to identify and understand specific pathways of change and assess long-term effects.

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