EFFICACY OF AN AMERICAN ALCOHOL AND HIV PREVENTION CURRICULUM ADAPTED FOR USE IN SOUTH AFRICA: RESULTS OF A PILOT STUDY IN FIVE TOWNSHIP SCHOOLS

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The high prevalence of HIV among young people in African countries underscores a pressing need for effective prevention interventions. Adapting school-based prevention programs developed in the United States for use in African schools may present an alternative to the time-consuming process of developing home-grown programs. The researchers report the results of a pretest-posttest field trial of an alcohol/HIV prevention curriculum adapted from an American model and delivered to ninth-grade students in five South African township schools. The revised intervention was based primarily on the Project Northland alcohol prevention and Reducing the Risk safer sex programs. The researchers found significant differences in change from baseline to follow-up between students in intervention and comparison groups on intentions to use a condom; drinking before or during sex; and, among females, sex refusal self-efficacy. The results of the field trial suggest that behavioral interventions developed in Western countries may be rapidly adapted to work in other cultural contexts.

Roughly 5 million of South Africa’s 45 million citizens are reported to be living with HIV/AIDS (UNAIDS, 2004), and AIDS is expected to account for 5 million to 7 million deaths of South Africans by 2010 (Dorrington, Bourne, Bradshaw, Laubscher, & Timaeus, 2001). The problem is particularly acute for adolescents, who are experiencing the fastest increase in HIV infections (Eaton & Flisher, 2001). Demographic and health surveys show that large proportions of South African adolescents regularly have unprotected sex with casual partners (Blecher, Steinberg, Pick, Hennick, &
Durcan, 1995). Although HIV/AIDS awareness among South African adolescents is reportedly high, the information has not changed the sexual behavior of youth (National Youth Survey, 2000).

The region of South Africa believed to be hardest hit by HIV/AIDS (UNAIDS, 2004) is Kwa–Zulu Natal. Antenatal clinic surveys show a HIV prevalence in the province of 36.5% (UNAIDS, 2004). As in other provinces, poverty, high incidence of other sexually transmitted diseases, male absenteeism from families owing to migrant labor patterns, violence against women, urbanization, high unemployment, and other factors have contributed to the AIDS pandemic (Eaton, Flisher & Aaro, 2003). The impact of the disease may be especially pronounced in KwaZulu-Natal for two reasons. The first is the presence in the province of two large trucking routes, where commercial sex workers (among whom HIV prevalence is roughly 50%, according to UNAIDS, 2004), are abundant. The second factor contributing to the spread of HIV in KwaZulu-Natal may be the phenomenon of “dry sex,” a practice in which desiccating substances are inserted into the vagina in order to make it “tight and dry” (Baleta, 1998). The practice, which is aimed at pleasing men and is common in KwaZulu-Natal, greatly increases the likelihood of infection (Baleta, 1998).

The risk behavior of school-going adolescents in KwaZulu-Natal is likely to be influenced by prevailing social and economic conditions. Schoolchildren in township areas are likely to come from poor households where breadwinners are either unemployed or hold low-paying service jobs. Such economic conditions result in schools in KwaZulu-Natal being severely underresourced. Many township schools are in a perennial budget crisis as evidenced by numerous broken windows, disconnected phone lines, and insufficient furniture, owing in large part to the inability of parents to pay schools fees because of high unemployment rates.

The magnitude of the epidemic indicates an urgent need for effective behavioral interventions. The South African government has yet to implement far-reaching plans for making affordable antiretroviral drugs available to ordinary citizens. Although some pharmaceutical companies have lowered their prices, the cost of antiretroviral therapy is still well out of reach of most South Africans. An effective HIV vaccine remains a distant hope. These factors raise the stakes for the efficacy of interventions promising to reduce the number of new infections among adolescents.

If effective school-based behavior change interventions developed in Western settings may be appropriately and effectively applied to South African schools with minor alterations, both the high cost and investment of time required to design and test new programs could be avoided. Ideally, South African researchers, health educators, and policy makers would develop interventions specifically tailored to the psychosocial and cultural characteristics of South African youth. But time is running short. If a program developed elsewhere can be rapidly adapted for use in South Africa and demonstrates effectiveness in reducing the risk behavior of South African youth, few would argue that it should not be delivered as widely as possible.

Western interventions successful at addressing risk behaviors other than unprotected sex, such as alcohol use, may also be useful in the South African context. Alcohol prevention interventions can contribute to risk reduction in South Africa for two reasons. First, South African youth have reported boredom with HIV prevention interventions as a result of perceived overexposure to such messages (Karnell, 2001). One way to avoid this problem is to deliver prevention programs ostensibly focusing on another associated risk behavior but which still offer HIV prevention information. The second reason an alcohol intervention may be effective is that alcohol use and un-
protected sex are strongly associated. In South Africa, as in other African countries, the use of alcohol among adolescents has been implicated in the spread of HIV (Adelikan, 2000; Rocha–Silva, 1998). Flisher, Ziervogel, Chalton, Leger, and Robertson (1996), for example, found associations among binge drinking, cannabis smoking, and sexual intercourse. In South Africa, as in the United States, alcohol is related to risky sex especially within first–time sexual encounters (see Flisher & Chalton, 2001). Thus, prevention messages focusing on alcohol avoidance or alcohol management may also delay sexual debut. In general, the knowledge, attitudes, and skills necessary to avoid risk behaviors such as binge drinking are closely related to those necessary to avoid risky sex.

This article presents the results of a field trial of an alcohol and HIV prevention curriculum adapted from an American model and delivered to ninth-grade students in five township schools in the Pietermaritzburg area of KwaZulu-Natal. The alcohol component of the intervention was based on the Project Northland alcohol prevention curriculum developed at the University of Minnesota by Cheryl Perry and colleagues (1996). Project Northland was shown to be successful in a controlled multiyear randomized trial in rural schools in northeastern Minnesota (Perry et al., 1996), and has been tested in several international settings. The sexual behavior component of the intervention was based in part on concepts and exercises from Reducing the Risk (Kirby, Barth, Leland, & Fetro, 1991). This curriculum has also been shown to be effective, particularly in delaying the onset of sexual activity (Kirby et al., 1991; Kirby et al., 1994).

METHODS

THE SETTING

Pietermaritzburg is the second largest metropolitan area in KwaZulu-Natal and South Africa’s fifth-largest city. It lies approximately 60 miles northwest of Durban and the Indian Ocean and is flanked by several large townships that are home to the majority of the metropolitan population. The population of these townships is almost exclusively Black. This study was conducted in two of Pietermaritzburg’s townships.

STUDY DESIGN

The design used in this study was a pre–post–quasi experimental design with random assignment to condition at the level of the school and the unit of observation was the individual learner. Of the five schools involved in the study, three were randomly selected to receive the intervention and two acted as comparison schools. Although homogeneity within schools could have led to significant underestimates of standard errors in data analysis, an average interclass correlation (rro) of .014 suggests that this problem did not occur in the current dataset. The pretest was administered in June 2002, with the posttest following approximately 5 months later.

The study subjects were students in ninth-grade Life Orientation classes. The demographics of the study sample are discussed below. The schools involved in the study had similar characteristics. All were attended overwhelmingly by Zulu–speaking African youth. None had boarding facilities, and each of the schools charged comparable school fees. Schools in the comparison condition continued to receive regular Life Orientation instruction throughout the study period, but in Grade 9 this instruction featured few modules concerning alcohol or HIV (Karnell, 2001).

Permission to carry out the study in the five schools was received from each school principal as well as from the district manager for Pietermaritzburg of the Kwa
Zulu–Natal Department of Education and Culture. In addition, human subjects approval was received from the University of Kentucky Institutional Review Board.

THE INTERVENTION

The centerpiece of the adapted curriculum consisted of a series of monologues delivered by four fictional township characters. These monologues were recorded on cassette and played by the teacher during each of the lessons. During the monologues the four characters described themselves, their parents and friends, their school and home life, and their dilemmas concerning whether to use alcohol and/or have sex. These performances served as the basis of class discussion and group assignments.

As in the original Project Northland curriculum, the adapted curriculum drew heavily on the assistance of peer leaders. Each participating class elected four peer leaders who received 2 days of training on the material. During the delivery of the program, peer leaders were responsible for leading discussions within their group and helping their group complete assignments.

The final adapted curriculum, Our Times, Our Choices, consisted of 10 units of 30 minutes each and was delivered over a period of approximately 8 weeks. The objectives of the program were to impart key HIV and alcohol related facts, enhance students’ understanding of the consequences of drinking alcohol and having unprotected sex, aid students’ identification of positive alternatives to drinking alcohol or having sex, expose students to specific techniques for resisting pressure to drink or have sex, give students the opportunity to practice such techniques through role play exercises, and enhance students’ ability to plan ahead to avoid situations in which they would be likely to engage in risk behaviors. Roughly half of the curriculum focused on alcohol related issues while the other half concerned HIV-related issues.

DEVELOPMENT OF SURVEY INSTRUMENT

The survey instrument, consisting of 106 questions, was piloted extensively with a group of roughly sixty ninth-grade students from a township school that was not involved in the main study but closely matched the other schools’ characteristics. Group cognitive interviews were held with a total of 30 students from this school—half male, half female—to probe their understanding of selected questions. Questions were translated into Zulu, back–translated into English, and then discrepancies were discussed and modifications were made in the English version of the survey with considerations made for respondents whose first language is Zulu.

The wording of some survey items was changed as a result of pilot testing and English–Zulu translation and back–translation. For example, it was determined that learners understood “having sex” to mean sexual intercourse. Though the term sexual intercourse has a precise meaning, when interpreting it on the survey learners lent it wide–ranging meanings and implications, whereas the term have sex clearly and specifically meant, to them, the act of sexual intercourse. Similarly, it was discovered that the term party did not reflect a gathering where drinking was likely to occur. Instead, learners identified a bash as being a specific kind of party in which alcohol is present and is consumed in large quantities and in which risk–taking behavior is likely to occur. Bash was thus incorporated into key items measuring self efficacy of alcohol and sex refusal.
SURVEY ADMINISTRATION

Questionnaires were administered during regular academic classes, with the pre-test occurring 2–3 weeks before the intervention period and the posttest 8 weeks after the conclusion of the curriculum. Care was taken to ensure that each group of students who completed the inventory received a standardized set of verbal instructions from the research assistant. The students’ regular classroom teacher was typically present while students worked on the surveys; however, the research assistant requested the teacher to remain as unobtrusive as possible, thereby decreasing reactivity to his or her presence. Large rooms such as auditoriums or the cafeteria were generally not available to allow students to spread out, and thus crowded classrooms were used. Typically it took 40–60 minutes to administer the survey to a classroom of students. During survey administration, the research assistant was available to supervise the session and to answer students’ procedural questions. Learners were given a sheet of blank paper with which to cover their answers. They received the pencil they used to complete the survey as a participation incentive.

MEASURES

Baseline and follow-up surveys assessed demographics, sexual and alcohol-related behaviors, and several theoretically derived variables hypothesized to mediate the relationship between the intervention and behavioral outcome.

Single items measured demographic variables including age, ethnic/tribal group, gender, parents’ education level, and several other variables related to household size and size of living quarters. The primary alcohol-related behavioral outcome measures for this study were frequency of alcohol use, quantity of alcohol use, and alcohol-related problems. The primary HIV-related behavioral outcome measures were ever having had sexual intercourse, condom use during sexual intercourse, and alcohol use concurrent with sexual intercourse.

Alcohol use and abuse was assessed with four measures. Respondents were asked with a single yes/no item whether they had ever drunk alcohol. Frequency of alcohol use in the last 14 days was determined with categorical response options (number of days). Quantity of alcohol use (for respondents who had ever had alcohol) was measured by how many drinks they consumed on the last occasion of drinking. Finally, a four-item alcohol problem scale assessed drinking-related problems by asking, for example, whether or not friends or family have confronted respondent about his/her drinking (Mitic, McGuire, & Neumann, 1987).

Ever having had sexual intercourse was assessed with a single yes/no item. Two items measured condom use: Frequency of condom use was measured with a 6-point Likert-type scale with 1 indicating “never” and 6 indicating “always,” and condom use during sexual intercourse was assessed by an item asking the respondent to indicate whether or not he/she had used a condom during his or her last sexual intercourse. Alcohol use concurrent with sexual intercourse was measured using items similar to those for condom use. For both condom use items and the item measuring alcohol use concurrent with sex, those who indicated that they had never had sexual intercourse were coded as missing.

Our Times, Our Choices, like the Project Northland and Reducing the Risk curricula from which it was derived, is based on three interrelated and overlapping theories: social learning, social inoculation, and cognitive behavior theory. These approaches informed the choice of mediating variables.
Social learning theory posits that the likelihood of a respondent’s adopting a prevention behavior (e.g., condom use to prevent HIV transmission), is determined in part by the respondent’s knowledge of how HIV is transmitted. Thus, the researchers measured general knowledge regarding prevention of HIV and other sexually transmitted diseases. Knowledge was assessed with 10 true or false items. Correct responses to these items were summed to create an index with a maximum value of 10.

Social learning theory also suggests that a youth’s motivation to adopt either a prevention or risk behavior will depend on his or her assessment of social norms regarding such behaviors. Accordingly, the survey asked respondents to indicate the proportion of their similar-aged friends who engaged in various AIDS risk behaviors such as sexual intercourse, alcohol use concurrent with sexual intercourse, and AIDS-protective behaviors such as delay of sexual activity and condom use. These items measured perceived social norms regarding sexual activity. Motivations to adopt prevention behaviors were assessed with two items: intention to have sexual intercourse and intention to use a condom consistently during sexual intercourse over the next 3 months.

Social learning theory asserts that youth can become motivated to adopt a prevention behavior after developing a positive attitude regarding prevention behaviors and a negative attitude toward risky behaviors. The researchers used a 6-item scale (Sacco, Levine, Reed, & Thompson, 1991) to assess the extent to which attitudes toward condom use were positive. The researchers also measured the extent of positive attitudes toward alcohol use using a five-item scale adapted from Noar, Laforge, Maddock, and Wood (2002). The Cronbach’s alpha coefficient for the original 10-item scale provided by Noar et al. was unacceptably low. When the scale was adapted to measure only the degree of positive attitudes toward alcohol by deleting five items measuring the degree of negative attitudes, the alpha coefficient of the scale improved (Table 1).

Inoculation theory posits that people develop a resistance to social pressure when they can recognize various forms of pressure and view themselves as capable of resisting pressure. Similarly, cognitive behavior theory asserts that young people need to perceive of themselves as possessing particular behavioral skills to resist pressures to engage in risky behavior. Accordingly, the researchers measured respondents’ perceived abilities to refuse sexual intercourse (sex refusal self-efficacy), use condoms (condom use self-efficacy), and refuse alcohol (alcohol use self-efficacy). Sex refusal self-efficacy was assessed using a 5-point Likert-type scale with 6 items measuring individuals’ ability to refuse sex in various situations (e.g., with a partner whom the respondent wants to date again) and was adapted from Cecil and Pinkerton (1998). Condom use self-efficacy was measured with five items, for example, “I feel confident that I would remember to use a condom even after I have been drinking,” adapted from Brien, Tombs, Mahoney, and Wallnau (1994). Finally, alcohol refusal self-efficacy was measured with a scale adapted from Williams, Toomey, McGovern, Wagenaar, and Perry (1995).

Sensation-seeking and impulsive decision-making adolescents are more likely to be at risk of early and problem alcohol and drug use, HIV infection, sexually transmitted diseases, and pregnancy because they engage in such behaviors as initiating sex at an early age, having multiple sex partners, and having sex following the use of alcohol and other substances. Zimmerman and Donohew (1996) established in previous research in the United States that school-based interventions designed to be novel and participatory are more effective in reaching adolescents who have high needs for sen-
<table>
<thead>
<tr>
<th>Scale Description</th>
<th>Number of Items in Scale</th>
<th>Response Format</th>
<th>Cronbach's Alpha Coefficient</th>
<th>Cronbach's Alpha Coefficient—US⁹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol problem</td>
<td>4</td>
<td>4 categories from &quot;never&quot; to &quot;many times&quot;</td>
<td>.76</td>
<td>.74 (3 items)</td>
</tr>
<tr>
<td>Attitudes toward condom use</td>
<td>6</td>
<td>Likert-type, 5 categories of agreement/disagreement</td>
<td>.69</td>
<td>N/A</td>
</tr>
<tr>
<td>Attitudes toward alcohol use</td>
<td>5</td>
<td>Likert-type, 5 categories of agreement/disagreement</td>
<td>.63</td>
<td>N/A</td>
</tr>
<tr>
<td>Sex refusal self-efficacy</td>
<td>6</td>
<td>Likert-type, 5 categories of confidence in ability to &quot;say no&quot; in situations posed</td>
<td>.86</td>
<td>.90</td>
</tr>
<tr>
<td>Alcohol refusal self-efficacy</td>
<td>6</td>
<td>Likert-type, 5 categories of confidence in ability to &quot;say categories of no&quot; in situations posed</td>
<td>.89</td>
<td>N/A</td>
</tr>
<tr>
<td>Condom use self-efficacy</td>
<td>5</td>
<td>Likert-type, 5 categories of confidence in ability to use a condom in situations posed</td>
<td>.77</td>
<td>.84 (4 items)</td>
</tr>
<tr>
<td>Impulsive decision making</td>
<td>16</td>
<td>Likert-type, 5 categories of agreement/disagreement</td>
<td>.63</td>
<td>.81 (8 items)</td>
</tr>
<tr>
<td>Sensation seeking</td>
<td>11</td>
<td>Likert-type, 5 categories of agreement/disagreement</td>
<td>.52</td>
<td>.67</td>
</tr>
</tbody>
</table>

Note: N/A = not applicable. Coefficients are taken from a study completed in August 2004 titled “Sexual Risk-Taking, Alcohol and HIV Prevention in Youth” targeted at high-risk populations in Louisville, KY and Cincinnati, OH. R.S. Zimmerman, principal investigator. Mean age of respondents = 14.6 years.
sation and novelty—high sensation seekers—and those who are impulsive decision makers. Accordingly, the sensation-seeking individual difference variable was assessed via a 16–item adolescent version of the sensation–seeking scale (Donohew, Zimmerman, Cupp, Novak, Colon, & Abell, 2000), and an 11–item decision–making style scale (Donohew et al., 2000) was used to measure impulsive decisionmaking.

CURRICULUM IMPLEMENTATION AND MONITORING

Teachers of Life Orientation in the three of the five schools involved in the study received 2 days of training on the curriculum. A total of 30 peer leaders also received 2 days of training on the material. The final half day of each group’s training was a joint session between teachers and peer leaders.

During curriculum delivery members of the research team observed the program being taught three to four times at each school, usually with unannounced visits. Observation checklists were used to record the level of participation during the lesson, the performance of peer leaders, the enthusiasm of the teacher, and other observations. In addition, teachers were given forms to fill out at the end of each lesson to record the time they spent on different sections of the lesson, how closely they followed the lesson plan, and additional comments. At the conclusion of the curriculum teachers were questioned regarding specific elements of implementation, including the time taken to present each unit, problems they experienced with the material, their degree of preparation, the adequacy of the training they received, and other matters.

ANALYSES

To assess intervention effects on both HIV– and alcohol–related variables, an analysis of variance was conducted using the posttest measure as the dependent variable and controlling for differences at pretest and the effects of gender and age. If the variable was dichotomous, a binary logistic regression procedure used the measure at posttest as the dependent variable and the measure at the pretest, gender, and age as factors.

RESULTS

SAMPLE DESCRIPTION

As shown in Table 2, the median age of the students participating in the study was 16 years. A total of 325 students in three schools received the intervention, while 336 in two schools were in the comparison group. The total sample size for the pilot

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total</th>
<th>Intervention</th>
<th>Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year median)</td>
<td>16</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Male</td>
<td>314 (49)</td>
<td>158 (50)</td>
<td>156 (48)</td>
</tr>
<tr>
<td>Zulu ethnic group</td>
<td>610 (94)</td>
<td>300 (94)</td>
<td>310 (93)</td>
</tr>
<tr>
<td>Lives with at least one parent</td>
<td>486 (75)</td>
<td>242 (77)</td>
<td>244 (73)</td>
</tr>
<tr>
<td>Feels close to mother</td>
<td>476 (80)</td>
<td>231 (80)</td>
<td>245 (81)</td>
</tr>
<tr>
<td>5 or more people living in household</td>
<td>484 (75)</td>
<td>232 (74)</td>
<td>252 (77)</td>
</tr>
<tr>
<td>Had used alcohol at pretest</td>
<td>317 (49)</td>
<td>157 (50)</td>
<td>160 (48)</td>
</tr>
<tr>
<td>Had had sex at pretest</td>
<td>210 (35)</td>
<td>93 (32)</td>
<td>117 (38)</td>
</tr>
</tbody>
</table>

The majority of those who were not Zulu identified themselves as Xhosa or Sotho.
study was 661. The sample was nearly all (94%) Zulu. Most (75%) lived with at least one parent, and the majority (75%) had five or more people living in their household. The sample was nearly equally split between males (49%) and females, nearly half (49%) had used alcohol at Time 1 and about one third (35%) had had sex at Time 1. Family income was not assessed directly in the survey instrument because it was determined that students would have difficulty accurately selecting their parents’ household income category. However, no significant differences were found between schools on social and economic status indicators such as level of parental education or number of people living in the household.

BASELINE DIFFERENCES BETWEEN THE INTERVENTION GROUPS

Students in the intervention group were significantly more likely to be younger than their counterparts in the comparison group \( (p < .01) \). However, age differences were controlled for in the analyses. Gender, ethnic group, whether living with at least one parent, living in a household with five or more people, alcohol use, and having had sex did not differ by intervention status.

At the pretest, overall scores for HIV–related knowledge and two out of the eight individual knowledge items differed by condition: Students in the intervention group were significantly more likely to achieve higher overall scores on HIV-related knowledge, to answer correctly that a condom will protect you if you have sex with an HIV-positive person, and to answer correctly that an HIV-positive man cannot cure himself of AIDS by having sex with a virgin.\(^1\) It should be noted that HIV knowledge scores were low across the sample, regardless of time and intervention status; the mean HIV knowledge score for both tests and groups was only 2.65 on a scale of 0 to 8.00. At the pretest, HIV related attitudes and intentions did not differ on the basis of intervention status.

At the pretest, three alcohol-related indicators differed significantly on the basis of intervention status: number of drinks consumed during last incidence of drinking, self-efficacy of alcohol refusal, and negative attitudes toward alcohol. At the pretest, students in the intervention group consumed significantly fewer drinks than their comparison counterparts, were more confident about their ability to refuse alcohol, and had more negative attitudes about alcohol. The other alcohol-related behavior indicators did not differ on the basis of intervention status.

At the pretest, condom use self-efficacy differed on the basis of intervention status: Students in the intervention group were more confident about their ability to use a condom correctly and negotiate the use of a condom. None of the other HIV–related behavior indicators differed by intervention status.

Given the number of variables examined in the study, it is not unexpected that there would be differences between conditions on a few items. To our knowledge, these differences were random and not systematic. These variations at baseline were largely controlled for in the repeated measures procedure used to determine change over time.

ATTRITION

Of the 661 students receiving the pretest, 536 (81%) were available to be tested again at follow-up. Those who dropped out of the study were fairly evenly distributed.

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\(^{1}\) Overall 14% of students answered in the affirmative—that an HIV-positive man who has sex with a virgin can cure himself of HIV—and 40% did not know the correct answer.
between the intervention and comparison groups (64 subjects dropped out of the intervention group; 61 dropped out of the comparison group). Study dropouts were significantly more likely to be older than the median age of the other subjects \( (p < .001) \), to have more than five people living in the household \( (p < .01) \), and to have used alcohol \( (p < .05) \). Attrition was unrelated to intervention group, and those who dropped out of the study were not any more or less likely to have had sex, to be male, to live with at least one parent, or to be a member of the Zulu ethnic group.

Seventy–seven percent reported at least “some” privacy in completing the survey. Degree of honesty or understanding of the survey did not differ by intervention status, but students in the intervention group were significantly more likely than their counterparts to feel privacy in completing the survey \( (p < .05) \). A reason for this difference was not apparent.

**PROCESS EVALUATION RESULTS**

Most students indicated that they understood the survey, and most reported privacy and honesty in completing it. Seventy–seven percent of students thought the survey was “easy to understand.” Seventy–two percent reported being “very” or “completely” honest in their answers. Seventy–five percent of the students receiving the curriculum reported that the four characters seemed “very” or “extremely” real to them, and 74 % found the curriculum “very” or “extremely” interesting overall. Teachers and students generally expressed satisfaction with the program’s peer leadership component. Although the pace of teachers’ implementation of the program varied, all teachers delivered the full curriculum in the prescribed time. Overall, teachers expressed satisfaction with the program and noted their students’ high interest level.

**INTERVENTION EFFECTS**

As shown in Table 3, no significant intervention effects were found on any of the alcohol–related behavioral outcome measures—frequency of alcohol use, and quantity of alcohol use, alcohol–related problems. Similarly, no intervention effects were found on any of the mediating alcohol–related variables, including alcohol use self–efficacy and attitudes about alcohol (positive or negative).

However, results showed an intervention effect on an HIV–related behavior after controlling for gender and age—alcohol use concurrent with sexual intercourse (Table 4). Intervention students who had not had sex at the time of the pretest were less likely to drink or indicate that their partners were drinking before or during the last time they had sex \( (p < .05) \). Results also showed an intervention effect among female students on an HIV–related mediating variable—sex refusal self–efficacy. Female students in the intervention group became more confident about their ability to refuse sex than female students in the comparison group \( (p < .05) \).

No intervention effect was reported for HIV–related mediating variables such as perceived social norms regarding sexual activity, attitudes toward condom use, or condom use self–efficacy. However, results did show an intervention effect on intention to use a condom among those who had had sex at the time of the pretest (Table 5). Controlling for baseline difference, gender, and age, intervention group students were more likely to indicate an intention to use a condom every time they have sex during the next 3 months \( (p < .01) \). There was no intervention effect on overall knowledge of prevention of HIV and other sexually transmitted diseases STDs, but students in the intervention group who had not had sex were more likely to answer correctly that a person need not have “many sex partners” to be at risk for HIV/AIDS \( (p < .05) \).
### TABLE 3. Alcohol–Related Behaviors and Mediating Variables: Change Scores and Net Intervention Effects for Selected Groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>Overall</th>
<th>Male</th>
<th>Female</th>
<th>Overall</th>
<th>Male</th>
<th>Female</th>
<th>Overall</th>
<th>Male</th>
<th>Female</th>
<th>Overall</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intervention</td>
<td>Comparison</td>
<td>Intervention</td>
<td>Effect</td>
<td>Intervention</td>
<td>Comparison</td>
<td>Intervention</td>
<td>Effect</td>
<td>Intervention</td>
<td>Comparison</td>
<td>Intervention</td>
<td>Effect</td>
</tr>
<tr>
<td>Frequency of alcohol use in last 14 days</td>
<td>0.23</td>
<td>0.28</td>
<td>-0.05</td>
<td>0.30</td>
<td>0.44</td>
<td>-0.14</td>
<td>0.09</td>
<td>0.03</td>
<td>0.06</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of drinks last time drinking</td>
<td>0.36</td>
<td>-0.08</td>
<td>0.44</td>
<td>0.28</td>
<td>-0.30</td>
<td>0.58</td>
<td>0.43</td>
<td>-0.81</td>
<td>1.24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcohol related problems</td>
<td>-0.02</td>
<td>0.04</td>
<td>-0.06</td>
<td>-0.06</td>
<td>0.05</td>
<td>-0.11</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcohol refusal self–efficacy</td>
<td>0.17</td>
<td>0.44</td>
<td>-0.27</td>
<td>-0.01</td>
<td>0.33</td>
<td>-0.34</td>
<td>0.31</td>
<td>0.50</td>
<td>-0.19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive attitudes about alcohol</td>
<td>-0.01</td>
<td>0.16</td>
<td>-0.17</td>
<td>0.09</td>
<td>0.03</td>
<td>0.06</td>
<td>-0.13</td>
<td>0.22</td>
<td>-0.35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative attitudes about alcohol</td>
<td>-0.15</td>
<td>-0.08</td>
<td>-0.07</td>
<td>-0.05</td>
<td>-0.16</td>
<td>0.11</td>
<td>-0.22</td>
<td>-0.06</td>
<td>-0.16</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### TABLE 4. HIV–Related Behaviors and Mediating Variables: Change Scores and Net Intervention Effects for Selected Groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>Overall</th>
<th>Male</th>
<th>Female</th>
<th>Overall</th>
<th>Male</th>
<th>Female</th>
<th>Overall</th>
<th>Male</th>
<th>Female</th>
<th>Overall</th>
<th>Male</th>
<th>Female</th>
<th>Overall</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intervention</td>
<td>Comparison</td>
<td>Intervention</td>
<td>Effect</td>
<td>Intervention</td>
<td>Comparison</td>
<td>Intervention</td>
<td>Effect</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Used a condom during last sexa</td>
<td>4.2</td>
<td>2.2</td>
<td>2.0</td>
<td>3.5</td>
<td>-0.5</td>
<td>4.0</td>
<td>2.5</td>
<td>2.5</td>
<td>0.0</td>
<td>-2.1</td>
<td>-5.5</td>
<td>3.4</td>
<td>5.7</td>
<td>6.4</td>
<td>-0.7</td>
</tr>
<tr>
<td>Self or partner drinking last sexa</td>
<td>-0.9</td>
<td>4.5</td>
<td>-4.4</td>
<td>-2.7</td>
<td>11.1</td>
<td>-13.8</td>
<td>2.6</td>
<td>-1.3</td>
<td>3.9</td>
<td>-0.6</td>
<td>0.7</td>
<td>-1.3</td>
<td>-0.1</td>
<td>14.9</td>
<td>-15.0*</td>
</tr>
<tr>
<td>Sex refusal self–efficacy</td>
<td>0.08</td>
<td>-0.16</td>
<td>0.24</td>
<td>-0.16</td>
<td>-0.05</td>
<td>-0.11</td>
<td>0.27</td>
<td>-0.26</td>
<td>0.53*</td>
<td>0.02</td>
<td>0.05</td>
<td>-0.03</td>
<td>0.14</td>
<td>-0.26</td>
<td>0.40</td>
</tr>
<tr>
<td>Condom use self–efficacy</td>
<td>-0.08</td>
<td>-0.06</td>
<td>-0.02</td>
<td>-0.10</td>
<td>-0.30</td>
<td>0.20</td>
<td>-0.03</td>
<td>0.12</td>
<td>-0.15</td>
<td>-0.21</td>
<td>-0.17</td>
<td>-0.04</td>
<td>0.01</td>
<td>0.00</td>
<td>0.01</td>
</tr>
</tbody>
</table>

*Percentage change scores. *p < .05
DISCUSSION

This randomized controlled trial of a 10–unit HIV and alcohol prevention curriculum adapted from an American model demonstrated modest changes in HIV–related behavior and variables thought to mediate preventive behavior among the ninth-grade South African students. The researchers found significant differences between students in the intervention and comparison groups on one behavioral indicator—drinking concurrent with sexual intercourse—and two mediating variables, intention to use a condom during sexual intercourse, and sex refusal self–efficacy. In sum, the findings of the study suggest that risk behavior interventions developed and tested in the West, after appropriate adaptation to the local cultural context, may bring about positive changes in risky behavior and variables thought to mediate risky behavior among school–going youth in other cultural settings.

The strongest effects of the intervention tested in this study were found in HIV–related behaviors and mediating variables. All but one of the seven indicators in these areas changed in a desirable direction among intervention group students from pretest to posttest.

The intervention had the least impact on alcohol related behaviors and mediating variables. The weakness of these results may be addressed by delivering a somewhat longer intervention. The Our Times, Our Choices curriculum was somewhat shorter than the Project Northland curriculum from which it was adapted; plans have been made to expand the curriculum for continued field testing in South Africa.

Although skills development rather than HIV knowledge was the focus of the curriculum, another area of relatively weak intervention impact was knowledge of HIV prevention. The low average HIV–related knowledge score recorded across the sample suggests that HIV–related knowledge among township students in KwaZulu-Natal is not as high as that commonly reported in South African studies (see Kelly, Parker, & Oyisi, 2001, p. 20), that students in the study may not be receiving as much formal HIV prevention education as they perceive, and that programs developed elsewhere and used in the South African context should be reviewed carefully prior to implementation to ensure that they clearly present and reinforce certain HIV–related facts.

LIMITATIONS OF THE STUDY

Many studies have found intervention decay to be a significant problem (see, for example, St. Lawrence, Brasfield, & Jefferson, 1995). Because the posttest was administered within 1½ months of the conclusion of the intervention, a follow-up study may be required to check whether the gains reported here have been sustained. Although we will not be able to gather follow up data from this particular group of students, a 5–year longitudinal study is under way in which there will be opportunities for longer term postintervention assessments.

Although significant differences at the pretest by intervention status were controlled for using a repeated measures procedure, these differences represent a potential study limitation. What accounts for significant differences detected at the baseline, such as higher levels of HIV–related knowledge and greater condom use self–efficacy among intervention group members, is unclear. No group was informed prior to the pretest that they would receive a particular HIV– and alcohol–related curriculum as this might have caused subjects to overestimate their ability to refuse alcohol or negotiate condom use. Schools were randomly assigned to conditions after the pretest was conducted. In addition, in our interactions with the schools, there were no
<table>
<thead>
<tr>
<th>Variable</th>
<th>Overall</th>
<th>Had Sex at Pretest</th>
<th>Had Not Had Sex at Pretest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intervention</td>
<td>Comparison</td>
<td>Intervention</td>
</tr>
<tr>
<td>Intention to have sex in next 3 months</td>
<td>0.00</td>
<td>0.06</td>
<td>-0.06</td>
</tr>
<tr>
<td>Intention to use condom every time next 3 months</td>
<td>0.18</td>
<td>-0.01</td>
<td>0.19</td>
</tr>
<tr>
<td>Positive attitudes toward condom use</td>
<td>0.17</td>
<td>0.08</td>
<td>0.09</td>
</tr>
</tbody>
</table>

*aThe change score represents the mean for the variable at Time 2 minus the mean for the variable at Time 1. The net intervention effect is the change score for the intervention group minus the change score for the comparison group. **p < .01.
apparent differences in resources or student support that would explain these variations. Finally, we used appropriate statistical methodology to minimize the effects of these differences on final data analyses.

The results of the study rely on self-report information, which is subject to misreporting. Although most students reported acceptable levels of honesty and privacy in completing the survey, lack of sufficient work space poses an obvious threat to privacy and may increase motivation to answer untruthfully. The relatively high percentage of respondents indicating they did not feel privacy in completing the survey represents a weakness in the study. In subsequent research among school-going youth in this context, multiple versions of the survey will be given to students in the same classroom so that two students seated close to one another are likely to be working, at any given time, on different sections of the document.

Although students indicated that the survey was easy to understand, an English-language medium may not be appropriate for students in this context, as students generally speak Zulu out of class. We intend to determine the appropriate language to use for future surveys by pre-testing shortened versions of the survey in both languages and comparing student comprehension and speed of completion.

The scales used in this survey were developed in the United States. Although they were piloted with South African adolescents, their psychometric properties could be improved with more extensive local piloting. To some learners, survey questions may have presented unfamiliar or difficult-to-imagine situations, or used unfamiliar vocabulary or syntax, and these problems could have negatively impacted scale reliabilities.

RECOMMENDATIONS FOR FUTURE RESEARCH

This pilot study pointed to several considerations for future research, including two areas of the intervention that need additional content. Basic knowledge about refusal, negotiation, and condoms and their use should be added to the curriculum. Also, given the intervention effects for sexual behavior and null results for alcohol-related behavior, additional focus on alcohol refusal-related skills should be added.

Although a pre-post quasi-experimental design yields some information about causal processes and the effects of an intervention, given the complexity of the outcomes being studied, longer term follow-up (12-18 months) would be needed to assess more fully the results of the intervention. A multicohort study that follows several thousand students for 12 to 18 months is currently under way.

As we have become more familiar with the South African environment, it has become increasingly clear that in addition to individual differences in personality, attitudes, and beliefs, cultural expectations, group norms, and sub-cultural differences in norms and values are important to take into account. Thus, future research should, at minimum, assess traditional views of the roles of males and females (particularly with respect to sexual behavior) and the extent to which individuals follow more traditional indigenous spiritual and/or Western spiritual or religious ideologies.

The advantage of adapted interventions is that they can be delivered quickly. But it is possible that locally developed interventions, because they may be more sensitive to cultural and group norms in the South African context, may ultimately prove to have stronger effects. Therefore, future research should support the development of locally made interventions and assess their performance against those of adapted ones.
Finally, future research should continue to explore the extent to which specific measures commonly used in developed countries are appropriate for use in developing ones. In the current study, formative research was conducted on some behavioral outcome measures. For most other variables, such as intention to use a condom, perceived social norms regarding sexual activity, extensive formative work to further understand how best to adapt these measures was not conducted (largely owing to time constraints).

Although reliabilities for scales were generally adequate and suggested the data collected were reasonably reliable and likely valid, our experiences suggested that the language of the self-report surveys used in this study needs to be reconsidered. All surveys were administered in English, the official language for public education in South Africa. In the townships of Pietermaritzburg, however, it became quite clear that teachers and students use both Zulu and English in the classroom and among themselves. We are currently in the process of evaluating the effects of using Zulu or Zulu–English surveys on data quality with this population. We advise researchers to consider that the official language of education may not necessarily be the best language in which to collect data or deliver the intervention.

It is exciting to have discovered that with some formative work over a few months, a curriculum designed for American students could be adapted for Zulu students in South Africa. Further research is required to help researchers and program planners learn more about the conditions under which Western–developed interventions are likely to be fairly easily adapted as compared to those under which adaptation would prove more difficult. Differences in language, religious and behavioral patterns, and the extent of modernization or globalization in the developing country context will almost certainly be among those factors that will help determine the likelihood of success at adapting Western–based interventions.

REFERENCES


