

# Effectiveness of a Brief Curriculum to Promote Condom and Health Care Use Among Out-of-School Young Adult Males

**CONTEXT:** Out-of-school black males aged 15–24 have higher levels of sexual risk-taking than in-school black males of the same age. However, few sexual risk reduction curricula are focused on out-of-school male youth.

**METHODS:** A sexual and reproductive health intervention conducted at a Baltimore youth employment and training program in 2008–2010 was evaluated in a study involving 197 youth aged 16–24 from a predominantly black population. Ninety-eight participants received three one-hour curriculum sessions on consecutive days; 99 served as controls. At baseline and three months later, participants completed a survey assessing demographic characteristics and various knowledge, attitude and behavior measures. Regression analysis with random effects was used to assess differences between intervention participants and controls in changes in outcomes over time.

**RESULTS:** In analyses adjusting for baseline characteristics, intervention participants showed greater improvements in outcomes between baseline and follow-up than did controls. Specifically, a male who received the intervention was more likely than a control male to report increases in knowledge of STDs and health care use (odds ratio, 1.6 for each), frequency of condom use (1.8), use of lubricant with condoms (23.6), communication with a provider about STDs (12.3) and STD testing (16.6).

**CONCLUSION:** These findings suggest the potential benefits of integrating safer-sex and health care information into a sexual and reproductive health curriculum for out-of-school male youth.

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Black males aged 15–24 have significant unmet sexual and reproductive health needs, as evidenced by their high rates of STDs, including HIV, and their partners' high rates of unintended pregnancy.<sup>1–6</sup> A substantial proportion of sexually active male adolescents report having had no recent contacts with health care providers,<sup>7</sup> and although young black males are more likely to report STD testing than are similar-aged whites and Hispanics, the proportion receiving such services is quite low.<sup>8</sup> Curricula designed to improve sexual and reproductive health typically focus on changing students' sexual knowledge, attitudes and behavior.<sup>9</sup> However, few address care-seeking for sexual and reproductive health services (e.g., STD testing), are designed specifically for young men, have been evaluated<sup>10–13</sup> or have been shown to be effective for males.<sup>11</sup> Furthermore, although out-of-school youth have higher levels of sexual risk-taking than those who are in school,<sup>14–16</sup> few interventions have been developed for or tested with this population.

Whereas school-based sexual and reproductive health interventions have demonstrated effectiveness in increasing participants' knowledge about STDs and safer-sex behaviors (including improvements in condom use frequency and consistency and declines in risky sexual behavior),<sup>17,18</sup> the translation of such curricula to reach young adult men can be challenging, especially in community-based settings. These curricula typically involve eight or more

contact hours over many weeks and require substantial facilitator training. They also demonstrate stronger behavioral results among younger than among older adolescents, and among students who have not yet had sex than among those who are sexually experienced.<sup>19</sup> Such curricula may not be effective for young black males living in urban settings, as many of these youth are not in school and are sexually experienced.

Sexual and reproductive health curricula that have been evaluated in community-based settings are typically more successful among female than male adolescents. The Carrera program—a curriculum originally offered to black and Latino teenagers in New York City—is an example.<sup>20</sup> In one evaluation of this program, possible reasons for such disparity included fewer hours of curriculum exposure among older males, little attention to the role of male social norms that de-emphasize the negative consequences of risky sexual behavior and a lack of communication messages for males to use with their partners.<sup>20</sup>

Like school-based curricula, community-based interventions rarely focus on sexual and reproductive health care use among males or assist young adult men—a population likely to be uninsured<sup>21</sup>—in visiting clinical settings that provide low-cost services. Studies examining care-seeking typically focus on females<sup>22,23</sup> or individuals who have not been exposed to a sexual and reproductive health intervention.<sup>12,24</sup> In one example of the latter type of study,

in which an intervention among males promoted access to preventive health care in a community setting, intervention and control participants showed no differences in scheduling or attending a checkup.<sup>12</sup> Possible reasons included lack of perceived barriers or benefits to accessing care, suggesting that males may be less cognizant of the benefits of preventive health care. A study that used peer outreach to target black adolescents with information about STD screening locations found that youth who had multiple contacts with program staff were more likely than others to get subsequent STD testing.<sup>24</sup> However, males tended to be less knowledgeable than females about STD symptoms and consequences, and were less likely to say they would get tested for an STD even if it was embarrassing. Another study evaluated a three-session sexual and reproductive health intervention among predominantly Latino young males enrolled in an employment and training program in New York City.<sup>11</sup> This study found that compared with control participants, at follow-up, intervention participants reported higher levels of sexual health knowledge, more positive attitudes about condom use and health care use, and fewer sex partners in the past three months, and were more likely to have visited a clinic for a sexual health checkup.

Employment and training programs are a community-based approach designed to give youth who have dropped out of school an opportunity to complete their education, gain job skills and seek employment. The five largest U.S. programs serve more than 350,000 youth annually.<sup>\*25</sup> Compared with in-school youth, participants in such training programs report substantially higher levels of risky health behaviors and have more limited access to health care.<sup>26</sup>

The present study replicates the three-session intervention conducted in a youth employment and training program in New York City;<sup>11</sup> our target population was the predominantly black young adult males enrolled in a comparable program in Baltimore. The main goal was to improve their knowledge of STDs and health care, health care use, and attitudes toward safer-sex behaviors, and to promote safer sexual behavior. We hypothesized that compared with control males, intervention participants would report greater improvement in STD and health care outcomes three months later, including increases in condom use and health care visits.

## METHODS

### Setting and Procedures

The study was conducted at a Baltimore youth employment and training center that provides social and educational services (e.g., GED classes, résumé building and job placement) to adolescents and young adults who are not currently in school or the workforce. The center is located

in an area characterized by high rates of poverty, school dropout and unemployment, and was originally funded in 2000 by a Youth Opportunity grant from the U.S. Department of Labor.

We employed a two-group quasi-experimental pretest-posttest design. Individuals were recruited in GED classes. At baseline, all participants completed a paper survey administered by project staff. The survey collected information on demographic characteristics, knowledge of STDs and health care services, attitudes toward condom use, sexual behavior and health care use. From August 2008 to December 2009, nine GED classes, with an average of 11 participants each, received the intervention; 12 classes, with an average of nine participants each, did not, and these served as the control group. Efforts were made to alternate between intervention and control conditions with sufficient buffer time to decrease the possibility of contamination. Approximately three months later, each participant completed a follow-up survey in person or by telephone that assessed the same measures as the baseline survey. Collection of follow-up data was completed in March 2010. The study was approved by the institutional review boards of Johns Hopkins University, the Baltimore City Health Department and the Maryland Department of Health and Mental Hygiene; participants gave consent to participate in research and permission to share their personal health information.

Before our study was implemented, the team who conducted the New York study met with project staff to review each session's learning objectives and lesson plans, as well as the materials needed and best practices for implementation. The New York team also guided the modification of lesson content and visual materials, to make the curriculum more culturally appropriate for a predominantly black audience and specific for the target setting, while ensuring that its health education messages were not altered. Modifications included changing neighborhood names in descriptive material, adding local art, and replacing photos with ones of persons of similar backgrounds and the local clinics for which the intervention provided information. The project staff also conducted two pilot tests of the curriculum with young black males from the community; the original study team observed these sessions and provided constructive feedback that was incorporated prior to implementation.

Inclusion criteria were being male, aged 16–25 at enrollment and English-speaking. A total of 223 male students were asked to participate in the study; all agreed to do so, and 197 completed the baseline survey, for an 88% completion rate. A total of 152 participants completed the follow-up survey, representing a 77% follow-up rate.

### Intervention

The intervention, consisting of three one-hour sessions led by two black male health educators, was conducted immediately following each GED class and was administered on consecutive days. The sessions used an interactive

\*These programs are the U.S. Department of Labor's Workforce Investment Act Youth Activities, Job Corps, YouthBuild, National Guard Challenge Program and Conservation Activities.

group discussion format, and PowerPoint presentations helped focus participant discussion of key concepts. Demonstration materials and hands-on activities were designed to encourage participation and emphasize the educational content.

Session 1 covered the identification of STD symptoms, ways to avoid STD acquisition (i.e., abstinence and condom use), modes of STD transmission, and the facts that STDs can be asymptomatic and can facilitate HIV transmission. Session 2 covered the proper use of condoms, the fact that proper use can prevent STDs and pregnancy, ways to make condom use more pleasurable and how to assist a partner in using an emergency contraceptive. Finally, session 3 described how men get examined during a clinical encounter and how they get tested and treated for chlamydia, and reinforced information from the earlier sessions. The third session also described two study referral clinics that serve teenagers and young adults in the community, showcasing the diverse male and female staffs, the facilities' attractive interiors and exteriors, and their affordable services. Both clinics are Title X-funded and offer family planning and sexual and reproductive health services, including routine physical examinations on a sliding-fee schedule; no one is turned away because of inability to pay. One clinic is five blocks from the intervention site, and the other is easily accessible via subway. The first two sessions included just location and contact information for these two clinics.

Each participant received a \$15 gift card after completing the baseline survey and an additional \$35 card when the three-month follow-up survey was completed. The program cost per participant was approximately \$270, including incentives, staffing and supplies.

## Measures

•**Demographic characteristics.** We assessed participants' age, race or ethnicity (black, white, Hispanic or other), last completed grade in school and current health insurance status (insured or not), as well as whether they had visited a doctor or other health care provider in the last 12 months when sick or in need of care.

•**Knowledge about STDs.** Participants were asked whether six statements about condoms and STDs were true or false; respondents could also answer that they were unsure. Statements included "If a man has an STD, he will always have symptoms, like bumps, a rash or a drip"; "Having an STD like gonorrhea, chlamydia or herpes increases a person's risk of becoming infected with HIV"; and "Putting lubricants ('lube') on the inside of a condom can increase sexual pleasure for men." Responses were coded as correct (1), or as incorrect or unsure (0), and then averaged to create an STD knowledge score.

•**Knowledge about health care.** Participants answered four items about health care: whether they know where to get health care services confidentially and where to get services for little or no money, and whether they had heard of each of the two clinics in the community. Responses

(1=yes, 0=no) were averaged to yield a total health care knowledge score.

•**Attitudes about condoms.** Two items elicited participants' attitudes and feelings about condoms. For the first item, "There is no way to enjoy sex when using a condom," responses ranged from "strongly agree" (1) to "strongly disagree" (4); the second item asked about participants' feelings regarding condoms, and responses ranged from "very negative" (1) to "very positive" (10). To assess expectations about condom use, participants were presented with the following hypothetical: "Picture a situation in which you wanted to have sex with a new partner but had no way to get a condom. What would you do in this situation?" Responses ranged from "definitely have sex" (1) to "definitely not have sex" (4).

•**Sexual behavior.** Participants answered five sexual behavior questions. Two items were "Have you had vaginal, oral or anal sex in the last three months?" and "The last time you had sex, did you use a condom?" Individuals were also asked how many partners they had had vaginal, oral or anal sex with in the past three months; responses were coded as none, one, two, or three or more. Another question asked, "When you had sex in the last three months, how often did you use condoms?" Responses ranged from "none of the time" (0) to "all of the time" (4). The last question was "When you used condoms over the past three months, did you put lubrication on them?" Possible responses were "no"; "yes, inside the condom"; "yes, outside the condom"; and "yes, inside and outside the condom." This variable was dichotomized to indicate use of any lubrication.

•**Health care use.** Participants were asked two questions about their health care behavior: "In the last three months, did you talk to a health care provider about STDs or HIV?" and "In the last three months, did you get checked for STDs or HIV?" Responses for both items were coded as no or yes. For the second item at follow-up, we combined self-report of getting checked for an STD in the past three months and, using registration data covering a period of six months, any visits made to the two participating community clinics.

## Analysis

We first generated frequencies for baseline demographic characteristics for all participants and by study condition. Next, we used chi-square tests to identify differences between participants assigned to the intervention and control groups. We then looked for differences between individuals who completed the study and dropouts. Since we found none, we included only completers in our subsequent analyses.

We conducted paired t tests or McNemar's tests of baseline versus follow-up data within study condition. Given the longitudinal nature of our design, we then applied a random intercept coefficient regression model that accounts for three levels (repeated measures, individuals and classroom) and allows us to estimate the odds

**TABLE 1. Percentage distribution of participants in a study of a sexual and reproductive health intervention for out-of-school men, by selected demographic characteristics at baseline, according to study condition, Baltimore, 2008–2009**

Characteristic	All (N=197)	Control (N=99)	Intervention (N=98)
<b>Mean age</b>			
16–17	35.0	29.3	40.8
18–19	35.5	36.4	34.7
20–24	29.4	34.3	24.5
<b>Race/ethnicity</b>			
Black	95.9	97.0	94.9
Other	4.1	3.0	5.1
<b>Last grade completed</b>			
≤9th	45.2	39.4	51.0
10th/11th	46.7	47.5	45.9
≥12th/GED	7.6	13.1	2.0**
Missing	0.5	0.0	1.0
<b>Has health insurance</b>			
Yes	61.4	64.6	58.2
No	37.6	35.4	39.8
Missing	1.0	0.0	2.0
<b>Visited provider in last 12 mos.†</b>			
Yes	58.4	60.6	56.1
No	37.1	35.4	38.8
Missing	4.6	4.0	5.1
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

\*\*p<.01. †When sick or in need of care. Note: Percentages may not total 100.0 because of rounding.

of an intervention participant's experiencing change in study outcomes between baseline and follow-up relative to those of a control participant. This type of analysis is well suited for examining individual changes over time,<sup>27</sup> particularly in a longitudinal intervention involving correlated multiple observations. It accounts for the correlation or dependency among observations within individuals by modeling within-person error, and also allows one to examine both within-individual change in outcomes and between-individual variation over time. An advantage of this type of analysis over the more traditional application of repeated-measures analysis of variance for the evaluation of treatment effects is that it handles unbalanced designs efficiently.<sup>28</sup>

We ran separate models for each outcome, with each treated as a time-varying variable. We first ran analyses while adjusting for last grade completed—the only demographic characteristic on which the intervention and control groups differed. Following a program logic model assuming that the intervention will lead to changes in knowledge and attitudes, which in turn will lead to behavior change, we conducted analyses while adjusting for appropriate baseline demographic, knowledge and attitude characteristics. Models examining knowledge controlled only for baseline demographic characteristics;

\*Participants who had completed high school or a GED were in classes to obtain further job training education.

models examining condom attitudes controlled for those characteristics and baseline knowledge of STDs; models assessing sexual behavior added controls for baseline condom attitudes; and models assessing health care use controlled for baseline demographic characteristics and health care knowledge. Models that examined sexual behavior and health care use included only participants who had had sex in the three months before baseline or follow-up (eight were excluded), and models of condom use included only those who had had sex in the three months before follow-up (20 were excluded).

Finally, we assessed whether reports of knowledge, condom attitudes and behavior changed between baseline and follow-up or remained the same. We conducted cross-tabulations to summarize these patterns of change in outcomes by study condition, and present the proportions of intervention and control participants who reported improvements from baseline to follow-up. All data were prepared using SPSS 12.0 and analyzed with Stata version 9.0.

## RESULTS

### Sample Characteristics

Of the 197 males enrolled at baseline, 98 were assigned to the intervention group. Among these, 75% attended all three sessions, 9% attended two and 16% attended one. Of those who did not attend all sessions, 16% attended only the first, 6% went to sessions 1 and 2, and 3% went to sessions 1 and 3.

Thirty-five percent of participants were aged 16–17, a similar proportion were 18–19 and 29% were aged 20–24; more than nine in 10 were black (Table 1). Forty-five percent had completed ninth grade or less, 47% had finished 10th or 11th grade, and 8% had graduated from high school or received a GED.\* Some 61% had health insurance, and 58% had visited a provider when sick or in need of care in the last year. Control participants were significantly more likely than intervention participants to have completed high school (13% vs. 2%).

### Study Outcomes

•**Knowledge about STDs and health care.** At baseline, control and intervention participants' mean knowledge scores for STDs were comparable (0.45 and 0.46, respectively—Table 2); the two groups' mean health care knowledge scores were also similar (0.36 and 0.35, respectively). At follow-up, the control group's knowledge scores had remained stable or declined, whereas for the intervention group, both scores had increased significantly (to 0.81).

In regression analysis that controlled for demographic characteristics, males who had received the intervention had improved knowledge scores by follow-up compared with control males (odds ratio, 1.6 for each). Twenty-five percent of intervention males and 17% of control males showed improved STD and HIV knowledge over time; 33% and 13%, respectively, showed improvement in health care knowledge (not shown).

**TABLE 2. Selected knowledge, attitude and behavioral characteristics of participants at baseline and three-month follow-up, by study condition; and odds ratios (and 95% confidence intervals) from multivariate regression analysis assessing the likelihood of intervention participants' experiencing a change in outcome over time relative to control participants'**

Characteristic	Control (N=77)		Intervention (N=75)		Odds ratio
	Baseline	Follow-up	Baseline	Follow-up	
<b>Mean knowledge scores</b>					
STDs (range, 0–1)	0.45 (0.27)	0.36 (0.27)**	0.46 (0.24)	0.81 (0.23)***	1.57 (1.44–1.71)***
Health care (range, 0–1)	0.36 (0.30)	0.35 (0.35)	0.35 (0.35)	0.81 (0.26)***	1.57 (1.40–1.76)***
<b>Mean attitude scores</b>					
No way to enjoy sex with a condom (range, 1–4)	2.74 (1.11)	2.83 (1.03)	2.93 (0.98)	3.28 (0.97)*	1.39 (0.93–2.09)
Feelings about condoms (range, 1–10)	7.97 (2.25)	7.68 (2.24)	7.78 (2.22)	8.09 (2.20)	1.62 (0.69–3.84)
Want sex with new partner, but no condom (range, 1–4)	3.05 (0.84)	3.09 (0.81)	2.92 (0.89)	3.21 (0.82)	1.20 (0.87–1.65)
<b>Sexual behavior in last 3 mos.</b>					
Had vaginal/oral/anal sex†	92.9	90.0	90.4	93.2	2.77 (0.46–16.53)
No. of partner†					
0	7.1	16.2	9.6	9.3	1.64 (0.47–5.70)‡
1	40.0	44.6	34.2	29.3	na
2	15.7	17.6	20.5	26.7	na
≥3	27.6	21.6*	31.1	34.7	na
Mean frequency of condom use (range, 1–4)§	2.66 (0.98)	2.44 (1.10)*	2.77 (1.05)	3.12 (1.06)*	1.83 (1.24–2.71)**
Used lubricant with condoms§	14.3	8.1	8.8	23.9*	23.61 (1.67–333.35)*
Used condom at last sex§	54.0	61.1	61.8	75.3	1.10 (0.88–1.34)
<b>Health care use in last 3 mos.†</b>					
Talked to provider about STDs/HIV	44.3	16.9***	26.0	45.4*	12.32 (3.81–39.79)***
Got checked for STDs/HIV	55.7	22.4***	28.8	36.0	16.62 (3.77–73.30)***

\* $p < .05$ . \*\* $p \leq .01$ . \*\*\* $p \leq .001$ . †Odds ratios were calculated for those who had had sex in the three months before baseline or follow-up. ‡Assessed as a continuous variable. §Odds ratios were calculated for those who had had sex in the three months before follow-up. Notes: Unless otherwise noted, data are percentages. Higher scores indicate greater knowledge, more positive attitudes or greater frequency. Figures in parentheses alongside means are standard deviations. Paired t tests or McNemar's tests were used to assess differences between baseline and follow-up values. See page 36 for a description of which variables were controlled for in the different regression models. na=not applicable.

•**Attitudes about condoms.** On average, at baseline participants said they somewhat disagreed that there was no way to enjoy sex when using a condom, they had positive feelings about condoms and they probably would not have sex with a new partner when they had no way to get a condom. At follow-up, control participants' mean scores for each measure had remained relatively stable. Although intervention participants expressed a more positive attitude at follow-up than they had at baseline toward enjoying sex with a condom (mean scores, 2.9 and 3.3, respectively), regression analysis controlling for baseline demographic characteristics and knowledge of STDs found no greater change in attitudes among intervention participants than among controls.

•**Sexual behavior.** At baseline, nine in 10 participants in each group reported having had vaginal, oral or anal sex in the last three months, and three in 10 had had three or more sex partners during this period. For the same time span, control and intervention participants said they had used a condom some of the time (mean scores, 2.7 and 2.8, respectively, on a four-point scale); 14% and 9%, respectively, reported using lubricant with condoms. More than half of participants in each group reported condom use at last sex. At follow-up, control participants' measures of sexual behavior had remained relatively stable or had declined, whereas intervention participants reported significant increases in use of condoms and of lubricants with condoms.

In analysis that adjusted for baseline demographic characteristics, STD knowledge and condom attitudes, males in the intervention group improved in both their frequency of condom use (odds ratio, 1.8) and use of lubrication with condoms (23.6) compared with controls. Twenty-three percent of intervention participants reported increased frequency of condom use over the study period, whereas only 10% of control participants did so; 20% and 2%, respectively, reported increased use of lubrication with condoms (not shown).

•**Health care use.** At baseline, 44% of controls and 26% of intervention participants said that they had talked to a health care provider about STDs in the last three months; 56% and 29%, respectively, said that they had gotten checked during that period. By follow-up, the proportion of intervention males who had talked to a provider had risen to 45%.

In regression analysis that controlled for baseline demographic characteristics and health care knowledge, males in the intervention group showed improvement in both talking with a provider about STDs and getting checked for STDs compared with their control counterparts (odds ratios, 12.3 and 16.6, respectively). Thirty-five percent of intervention participants, compared with 6% of control participants, showed improvement in talking to a health care provider about STDs; 18% and 4%, respectively, showed improvement in getting checked for an STD (not shown).

•**Session attendance.** We also examined whether the number of sessions that a participant attended was associated with any of the outcomes (not shown). Overall, regardless of attendance, all intervention participants demonstrated increases in both knowledge scores over time. For the behavioral outcomes, attendance at all three sessions was associated with increases in the frequency of condom use, any lubricant use with condoms and health care use; attendance at the first two sessions was associated with an increase in health care use, while attendance at only the first session was correlated with increases in the frequency of condom use and talking with a provider about STDs.

## DISCUSSION

This study successfully replicated—among a predominantly black population of young adult males enrolled in a community-based youth employment and training program—an intervention that was originally designed for a predominantly Latino population of young males enrolled in a similar program in New York City.<sup>11</sup> Our findings showed that young men who received a three-hour intervention delivered on consecutive days reported increases at three-month follow-up in their knowledge of STDs and health care services, frequency of condom use, use of lubrication with condoms, and care-seeking behavior regarding STDs. This is one of only two studies<sup>11</sup> to find associations between a brief intervention and an increase in the reporting of safer-sex behaviors among out-of-school young adult males.

Our results are similar to those reported in the original study,<sup>11</sup> yet some notable differences may reflect variations in procedures and target populations. Consistent with the original study, we found an improvement in reporting of STD testing, but our follow-up period (based on self-report at three months and clinic visit data through six months) was shorter than the original's (18 months of clinic data). We also found increased reports of having talked to a provider about STDs (which was not assessed in the original study). Rather than assessing health care attitudes, as the original study did, we assessed health care knowledge, and we found that at baseline, many out-of-school male youth had substantial room to improve their knowledge. This finding is consistent with results of research showing that young adults lack information about health care resources, especially related to STD testing, in their community.<sup>29</sup>

This curriculum is unique in integrating health care content and sexual health information for males; its explicit description of why sexually active males need to engage in health care and its provision of information about local, low-cost services appear to be effective in the short term. Further research might examine whether a similar brief curriculum could be adapted to promote health care knowledge and behaviors among other populations of males, many of whom do not access needed sexual and reproductive health care. For example, brief curricula might work in other community locations where young

men congregate (e.g., barbershops and youth centers) or in criminal justice facilities. A study in a justice setting addressing health needs, including sexual health, found reductions in drug dependence one year after release, but found no differences in subsequent involvement in risky sexual behavior; it did not include or evaluate content on use of health care.<sup>30</sup>

Consistent with the original New York City study,<sup>11</sup> the present study found significant improvement in condom use behaviors. Participants who received the intervention reported increased frequency of condom use and greater use of lubrication with condoms at follow-up than they had at baseline. However, the original study's intervention participants also reported significantly fewer recent sex partners at follow-up than at baseline, a finding that was not replicated in our study. Perhaps the health educators implementing our curriculum placed greater emphasis on the importance of regular condom use and the consequences of nonuse, and did not extend health promotion messages to reducing numbers of partners and related risks. In addition, because of cultural differences between the study populations (Latino vs. black males), the intervention messages regarding reducing numbers of sex partners may have resonated differently. Future research needs to explore how to deliver messages about reducing the number of partners among sexually experienced males who report a history of many past partners.

Another difference between the two studies is that participants in the original one reported more positive condom attitudes (e.g., rating condoms more favorably) at follow-up, while our participants reported marginally more positive attitudes three months later. This might be explained by the highly positive condom attitude scores at baseline among all of our participants, which suggested little room for improvement. Alternatively, our participants' barriers to condom use may not have been related to the types of attitudinal barriers covered in the curriculum. Despite the modest change in condom attitudes in our study, participants who received the intervention reported a significant increase in the rate of condom use in the three months prior to follow-up. Further work might explore population-specific barriers to condom use prior to implementing a similar curriculum. For example, providing educational messages about condom use with different partner types might lead to improvements in all condom use measures.

## Limitations

This study has several potential limitations. First, although efforts were made to alternate between intervention and control conditions, with buffer time to limit contamination between subjects, the project was conducted in one location, which increased the risk. However, if contamination occurred, we hypothesize that differences between the intervention and control groups would have been smaller than those found. Second, the unit of intervention

was the classroom, rather than the individual. Although this was accounted for in our analytic approach, it may limit the study's explanatory power. Furthermore, samples were small, which may explain why a few of the odds ratios were quite large and had wide confidence intervals. Examination revealed that these results reflected that the samples were small and that fewer control participants than intervention participants showed improvements over time in dichotomous outcomes, rather than reflecting problems with outlying data points, multicollinearity or missing data. In addition, lack of randomization at the individual level may have resulted in differences between the control and intervention groups in health care behavior outcomes, despite minimal demographic differences between the groups. Also, unmeasured variables may have affected our findings; in particular, we recommend that subsequent studies assess the frequency of sexual behavior and formal receipt of sex education, and conduct tests to assess pregnancy and STD infection. Finally, the three-month follow-up period is relatively brief; future research should examine whether participants' changes in knowledge and behavior are retained over a longer period of time.

## Conclusions

This study highlights the promise of a limited and relatively inexpensive intervention for employment and training programs that serve out-of-school male youth who have high levels of risky sexual behaviors. Our findings suggest the potential benefits of integrating specific and practical information about health care use into a standard sexual health curriculum for young adult males.

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