Structural Intervention With School Nurses Increases Receipt of Sexual Health Care Among Male High School Students

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Abstract

Purpose: Adolescent males are less likely to receive health care and have lower levels of sexual and reproductive health (SRH) knowledge than adolescent females. The purpose of this study was to determine if a school-based structural intervention focused on school nurses increases receipt of condoms and SRH information among male students.

Methods: Interventions to improve student access to sexual and reproductive health care were implemented in six urban high schools with a matched set of comparison schools. Interventions included working with school nurses to improve access to sexual and reproductive health care, including the provision of condoms and information about pregnancy and sexually transmitted disease prevention and services. Intervention effects were assessed through five cross-sectional yearly surveys, and analyses include data from 13,740 male students.

Results: Nurses in intervention schools changed their interactions with male students who visited them for services, such that, among those who reported they went to the school nurse for any reason in the previous year, those in intervention schools reported significant increases in receipt of sexual health services over the course of the study compared with students in comparison schools. Further, these results translated into population-level effects. Among all male students surveyed, those in intervention schools were more likely than those in comparison schools to report increases in receipt of sexual health services from school nurses.

Conclusions: With a minimal investment of resources, school nurses can become important sources of SRH information and condoms for male high school students.

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Keywords

Adolescent males; Access to condoms; Sexual health information

Providing high-quality sexual and reproductive health care (SRHC) is an important part of preventing and reducing unintended pregnancy, sexually transmitted disease (STD), and HIV/AIDS among young people. The American Medical Association recommends that adolescents aged 11–21 years have annual preventive health service visits and receive guidance and counseling on topics ranging from responsible sexual behavior to methods of birth control and STD prevention [1]. The *Guidance for Providing Quality Family Planning* Services by the Office of Population Affairs and Centers for Disease Control and Prevention (CDC) recommends all reproductive-aged individuals, including young men, receive family-planning services [2]. Although utilization of health care does not differ by gender among younger adolescents (11–15 years old), older male adolescents utilize less health care (including family physicians and emergency departments) than older female adolescents [3]. Compared with females, adolescent males are less likely to access SRHC services and are less likely to discuss sexual health topics with a health-care provider or a parent [4]. With an increased understanding of this gap [3,5–8], there is a clear need for the development of new strategies to address it.

Although males, compared with females, have generally not been a focus of intervention efforts like sexually transmitted infection screening and unintended pregnancy prevention efforts, there has been some success in addressing the SRHC needs of male adolescents. For example, in an intervention targeting first-time clinic patients receiving routine physical exams, participants showed increased sexual and reproductive health (SRH) knowledge and frequency of safer sexual behaviors [5].

Although often overlooked as a source of SRH information and services, school nurses play a vital role in the health of our nation's children. School nurses provide episodic care and manage chronic conditions, as well as promote health behaviors and connect children with external health-care providers [9]. School nurses are well positioned to also provide SRH information and condoms, and make referrals for health services. A 2006 study found that nearly half of US high schools employed at least one full-time nurse and another 25% employed a part-time nurse [10], indicating that many high schools could make use of this resource to raise not only male adolescents' awareness of their need for services but also their awareness of services already being provided at school.

Project Connect was an adolescent pregnancy and STD prevention program implemented in a public school district in Los Angeles County, California. It consisted of activities targeting parents, health-care providers, schools, and communities in order to improve SRHC among youth. Among other activities, successful efforts to improve receipt of reproductive health care included the implementation of systems-level interventions to connect students to community-based sources of care [11] and improve existing condom availability programs [12]. Previous analyses have determined that the interventions were effective in increasing the utilization of reproductive health care among sexually experienced female adolescents (i.e., receipt of birth control in the past year, STD testing or treatment in the past year, and

ever receiving an HIV test) [11] and receipt of condoms among all students in the intervention schools, relative to comparison [12]. The original intention was not to focus on school nurses, but as the interventions were designed and implemented, school nurses played a prominent role. The school-based intervention activities that relied heavily on nurse involvement were efforts to improve the implementation of the school district's condom availability policy and the development and implementation of a health-care provider referral guide, intended to connect sexually active students to community health-care providers who were identified as providing high-quality SRHC to adolescents. School nurses were the primary condom distributers in schools and were most heavily engaged in providing referrals to students by making use of the Project Connect referral guide. The project brought together school and district nursing staff and community-based health-care providers to discuss referral barriers, and this increased nurses' comfort in making referrals. By engaging all intervention school nurses early in the process (e.g., through preintervention assessments in which education and training needs were identified), by raising their awareness of the SRH needs of the students at their schools as well as of district policies related to SRH, and by treating nurses as public health advocates for the SRH needs of students, they became champions for Project Connect, with school administrators and the district. The purpose of this analysis is to examine whether factors related to school nurse utilization, addressed directly by components of engagement and education of school nurses in a broader systemic, structural intervention, had a population-level impact on the male students in the intervention schools, particularly those who were sexually experienced. The research questions are as follows:

1. Did visits to the school nurse, for any reason, increase among male high school students in intervention schools, relative to comparison schools?

2. Among males who went to the school nurse for any reason, did those in intervention schools report receiving more condoms or SRH information than males in comparison schools who reported going to the school nurse for any reason?

3. Did male high school students in intervention schools report more visits to the school nurse for condoms or SRH information over the course of the study, relative to males in comparison high schools?

4. Did sexually experienced males in intervention high schools report more visits to the school nurse for condoms or SRH information over the course of the study, relative to sexually experienced males in comparison high schools?

Methods

Participants and procedure

Twelve high schools in attendance areas[1] with rates of chlamydia and births among 15- to 19-year-olds exceeding Healthy People 2010 [13] goals participated in Project Connect. Schools were selected and matched based on size and demographics, availability of a

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[1]The geographic boundaries that define which high school a student attends, according to his/her home address.

school-based health center, and geography. Schools from each pair were purposively assigned to either the intervention or the comparison group so that no comparison school shared a geographic border with an intervention school.

Project Connect was implemented over 5 years with recruitment and data collection occurring during the spring semester annually from 2005 through 2009 (TI–T5). At each time point, the students of randomly selected 9th- to 12th-grade required classes (e.g., health, history) were eligible for the study and were invited to participate in the survey. The surveys were self-administered, taken in English or Spanish, and completed in 30 minutes during one class period.[2] Students could have participated in multiple years (15.4% of the sample provided more than one survey).

Parental permission and assent forms were required for minors; students 18 years old or older consented for themselves. Across the entire study period, of the 68,022 students enrolled in the selected classes, 56% (n = 37,752) returned parental consent forms, of which 94% (n = 35,468) received their parents' consent for participation. Among the students with parental permission, about 15% did not participate in the survey because of their own refusal or absence from class. Overall, 84% of students who consented (n = 29,823) completed the survey. Parental permission return, consent rates, and student participation rates did not vary by condition.

Study materials and procedures were approved by the school district and institutional review boards of the University of Southern California/Health Research Association, the Los Angeles County Department of Public Health, and the CDC. Sample sizes for five cross-sectional samples at five time points, T1–T5, were 5,930; 5,831; 5,878; 6,164; and 6,020, respectively. Data for this analysis included those from 13,740 high school males, 2,709 at T1; 2,636 at T2; 2,690 at T3; 2,910 at T4; and 2,795 at T5.

Intervention

School nurses in intervention schools were provided education and training prior to the start of data collection and throughout the intervention period. They were involved in four categories of intervention activities: (1) inclusion in program development; (2) professional development; (3) clarification on policies and practices; and (4) program implementation. These included being members of advisory groups on designing interventions, education on school policies related to receipt of confidential medical services by students, including school release policies, the provision of referral guides to community-based services, meetings with community-based providers of sexual health services, and sexual health education materials and condoms for provision to students.

Measures

Use of school nursing services.—To assess use of school nursing services students were asked, "Have you gone to the school nurse's office this year?" with a binary response (yes/no). To assess condom acquisition and receipt of SRH information students were asked,

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[2]Although surveys were available in only English or Spanish, there were no reported incidents of a student being unable to participate because of a language barrier.

"Did you go to the school nurse's office this year for any of the following reasons? Please mark yes or no for EACH question," including four SRH items: "To get condoms," "To find out where to go to get birth control or treated for an STD," "To find out what to do about a pregnancy," and "Information about sex." Students were coded as having received sexual health services if they affirmatively endorsed any of the four SRH response options (1/0).

Control variables.—Previous research suggests that acculturation may be a potential barrier to accessing HIV prevention services among Hispanic populations [14]. Because the Project Connect sample was largely Hispanic, we included four indicators of acculturation as control variables: race/ethnicity, primary language spoken at home, generation of immigration, and language of survey administration. Race/ethnicity was coded into three categories: Latino, black, or other. Language primarily spoken at home had three categories: English exclusively, other languages exclusively, and a mixture of languages. Survey administration language had two options: English or Spanish. Generation of immigration had three categories: child and parents foreign born; child US born, one or both parents foreign born; and both parents born in the United States.

We included four contextual covariates associated with STI and pregnancy risk: ever had sex, having a sibling who was pregnant or got someone pregnant as a teen [15], having a peer who was pregnant or had gotten someone pregnant [16], and family structure [17]. All three covariates were coded dichotomously (present/absent).

Additionally, we included variables to control for other healthcare uses, grade, and a variable for the six matched school pairs. Because the use of one type of service can predict the use of another [18], we included receipt of other health services, which was assessed with a single question: "Did you see a doctor or nurse in the past year for any of the following reasons?" Students who affirmatively endorsed "A regular check-up or physical when you weren't sick or injured," "Sickness (like a fever or infection)," "Ongoing illness (like asthma or diabetes)," or "An injury (like a broken bone or cut)" were coded as having received other health care in the past year. Students who selected "no" for all of the items were coded as not having received other health care. Grade was categorical, capturing the students' grade of enrollment, and finally, the high school pair variable was a categorical variable with six levels corresponding to six matched schools.

Statistical analyses

Data were analyzed in IBM SPSS Statistics v. 21 (IBM Corporation, Armonk, NY) using generalized estimating equations (GEEs) with a logit link to account for the repeated observations of some students and the dichotomous outcomes. The GEE approach fits nonlinear regression models to correlated data. We chose an unstructured working correlation structure due to its flexibility. However, the inferences were robust regardless of the working correlation structure chosen.

First, we examined intervention effects on visiting the school nurse in the past year among all male high school students. Intervention effects on receipt of condoms or SRH information from the school nurse were assessed in three separate analyses, including (1) just those male students who had visited the nurse in the previous year; (2) all male students

in the study schools; and (3) all sexually experienced male students in the study schools. All models included a two-level group variable comparing intervention and comparison students, a five-level factor accounting for the main effect of time, the interaction between time and group, and the 11 control variables. Our interpretation of findings focused primarily on the omnibus statistical tests for the group and time-by-group interactions. The directionality of the effects was determined based on the adjusted odds ratios from the GEE model. Finally, chi-square tests were used to determine statistical significance between intervention and comparison conditions for the raw percentages in Figures 1 and 2.

Results

Male students in the sample were, on average, 16.3 years old (SD = 1.36), 80.4% were Latino, and 9.1% were identified as African-American. More than half (52.1%) reported having engaged in sexual intercourse. Two fifths (40.1%) of the sample reported having gone to the school nurse in the past year, with 12.1% reporting having gone to the school nurse for either condoms or SRH information. Table 1 contains demographic information for the sample at baseline, by intervention group. There were significant baseline differences in grade, generation of immigration, language spoken at home, and survey language. However, there were no significant baseline differences in any other control variables.

Visited the school nurse in the past year

First, we examined intervention effects on male students' reports of having been to the school nurse in the past year. As can be seen in Table 2, there was a significant group effect (χ^2 = 14.00, df = 1, p < .001) and time-by-group interaction (χ^2 = 60.15, df = 4, p < .001), such that students in intervention schools were significantly more likely to have gone to the school nurse in the past year than those in the comparison schools between T1–T4 (Adjusted Odds Ratio [AOR] = 1.39; 95% confidence interval [CI] = 1.10–1.76) and T1–T5 (AOR = 1.79; 95% CI = 1.41–2.27). From T1–T2, students in the intervention schools were significantly less likely to have gone to the school nurse in the past year compared with those in the comparison schools (AOR = .76; 95% CI = .59–.96). There were no significant differences among T1–T3 (AOR = .99; 95% CI = .78–1.26).

Receipt of sexual health services from the school nurse in the past year

To examine intervention effects on receipt of condoms or SRH information from the school nurse, first we examined male students who went to the school nurse in the past year (n = 4,329). As can be seen in Table 2, there was a significant group effect (χ^2 = 24.07, df = 1, p < .001) and time-by-group interaction (χ^2 = 27.39, df = 4, p = .012) in those students' receipt of sexual health services, such that students who had gone to the nurse in the past year in intervention schools were significantly more likely than those in comparison schools to report having received sexual health services from the school nurse between T1–T3 (AOR = 2.00; 95% CI = 1.18–3.39) and T1–T5 (AOR = 3.43; 95% CI = 1.93–6.09). There were no significant differences for T1–T2 (AOR = .71; 95% CI = .42–1.19) or for T1–T4 (AOR = 1.59; 95% CI = .94–2.70).

Next, we examined the same model among the entire sample of male students. As can be seen in Table 2, there was a significant group effect ($\chi^2 = 33.61$, $df = 1$, $p < .001$) and time-by-group interaction ($\chi^2 = 38.89$, $df = 4$, $p = .029$) for students' receipt of sexual health services from the school nurse in the past year,[3] such that male students in intervention schools were significantly more likely than male students in comparison schools to report having received these services from the nurse between T1–T3 (AOR = 1.60, 95% CI = 1.10–2.33), T1–T4 (AOR = 1.90, 95% CI = 1.31–2.77), and T1–T5 (AOR = 2.28; 95% CI = 1.56–3.32). From T1 to T2, there were no significant differences (AOR = .85; 95% CI = .58–1.24).

We further examined these findings among those male students who were sexually experienced. As can be seen in Table 2, among male students who reported ever having had sex, there was a significant group effect ($\chi^2 = 23.00$, $df = 1$, $p < .001$) and time-by-group interaction ($\chi^2 = 38.31$, $df = 4$, $p = .012$) in receipt of sexual health services from the school nurse. Sexually experienced male intervention school students were significantly more likely than their comparison school counterparts to report having received those services from the school nurse in the past year between T1–T4 (AOR = 2.39; 95% CI = 1.54–3.70) and T1–T5 (AOR = 2.52; 95% CI = 1.63–3.90). There were no significant differences for T1–T2 (AOR = .87; 95% CI = .56–1.35) or for T1–T3 (AOR = 1.50; 95% CI = .97–2.32).

Figure 1 shows the raw percentages for students who went to the school nurse in the past year by intervention year and condition for all male high school students, and Figure 2 shows receipt of sexual health services in the past year from the school nurse by intervention year and condition for all male high school students, sexually experienced male high school students, and only male high school students who reported going to the school nurse for any service. Generally, there were decreases over time for the comparison group but increases for the intervention group.

Summary

These findings suggest not only that intervening with school nurses results in a direct impact on the students who visit the nurse, regardless of the reason for that visit, but that this effect can be seen among all male students in a school. In our intervention schools, by the end of the study period more than 25% of male sexually experienced intervention students reported receiving sexual health services, defined here as getting condoms or finding out where to get birth control or treated for an STD, or other information about sex, compared with 13% for the comparison group.

Discussion

Research suggests, and previous analyses on Project Connect confirm, that efforts to increase receipt of reproductive health care often fail with males. The current analyses indicate that intervening with school nurses may be an effective strategy for increasing both visits to and receipt of services. The effects demonstrate that changing environments for

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[3]Follow-up analyses focusing just on receipt of condoms from school nurses in the past year followed a similar statistically significant pattern.

youth takes time but that the impact can be significant and long-lasting. Although we did not see differences between males in comparison and intervention schools at Time 1 and Time 2, in the later years of the project the numbers of males who got SRH services from school nurses were substantially higher in intervention schools compared with controls.

We created a low-cost and sustainable intervention that had direct effects on male students visiting the nurse as well as all male students in the school without intervening directly with the students. Over the course of several years we built capacity among the nurses by educating them about district policies and empowering them to provide services to their students. In many cases, we educated the nurses about sexual health topics. We believe the intervention made them feel invested in the sexual health care of their students by involving them in the development of programs, and we connected them to community-based sources of care in their communities. Nurses were given educational materials and condoms to provide to students, which may have helped facilitate their interactions with students on sexual health. These efforts amounted to a relatively small number of hours—there was organization time spent by study staff, interactions with the district's nursing coordinators, and meeting time with the nurses. Plus, these efforts were done in partnership between study staff, school district staff, and county health department staff in a manner that could easily be replicated.

Limitations

There are, of course, a number of limitations to this study. Due to active parental permission requirements and our consent process that involved sending information for parents home with students, our response rate was low, but there was little parental refusal, and the bulk of students who did not participate resulted from unreturned permission forms. Additionally, selection bias may have resulted in differences in risk between students who failed to return parental permission forms and those who participated. Furthermore, our school selection and matching process, although conducted to maximize our reach to at-risk students and to ensure the integrity of intervention implementation, may have had an impact on our findings.

The study was conducted in a large urban school district with school nurses in all of our participating schools. Evidence now suggests that school nurses are a cost-effective investment for school districts [19]. However, schools are increasingly without full-time nurses or without any nursing staff [20], which may partly explain the decrease in visits to the nurse reported by males in our control schools. It also may be difficult for other school staff to make the same connections with male students regarding their SRHC needs. There may be opportunities for coaches, health teachers, counselors, or other trusted staff members to fulfill this role with appropriate preparation. Furthermore, district policy may limit or prohibit condom distribution, limiting the potential role of school nurses. Still, the provision of medically accurate information may be just as important for males who may not be receiving this information elsewhere [21]. Finally, this study relied solely on student self-report of visits to school nurses and of services received. We were unable to obtain perspectives of school nurses, which would have added valuable information and should be considered in future work. Additional work could include training opportunities for school staff and evaluation of different models of training, provision of information, and referrals.

With a minimal investment of resources, school nurses may become important sources of SRH services for male high school students and may serve as a connection to the larger healthcare system, providing assistance to male students as they transition to adult care. With the need to build trust and relationships among school administrators, nurses, and healthcare providers, this approach will take some time to show impact; however, by making an investment in the potential of nurses to build their skills in this area, a significant impact on student health may be achieved.

Funding Sources

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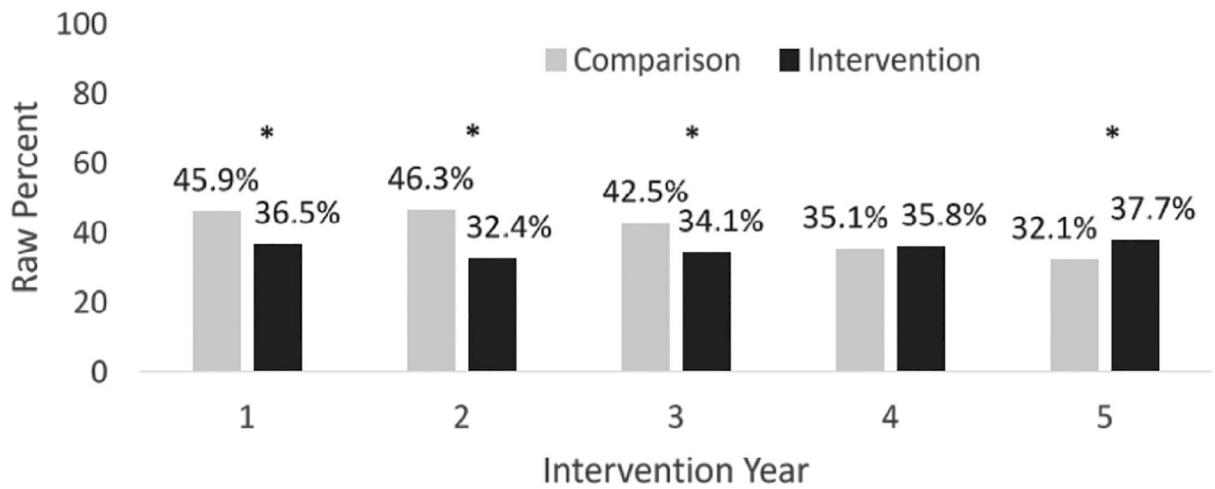
IMPLICATIONS AND CONTRIBUTION

Adolescent males often do not receive sexual and reproductive health information and care. With a minimal investment of resources, school nurses may become important sources of sexual and reproductive health information and condoms for male high school students, and may serve as a connection to the larger health-care system.
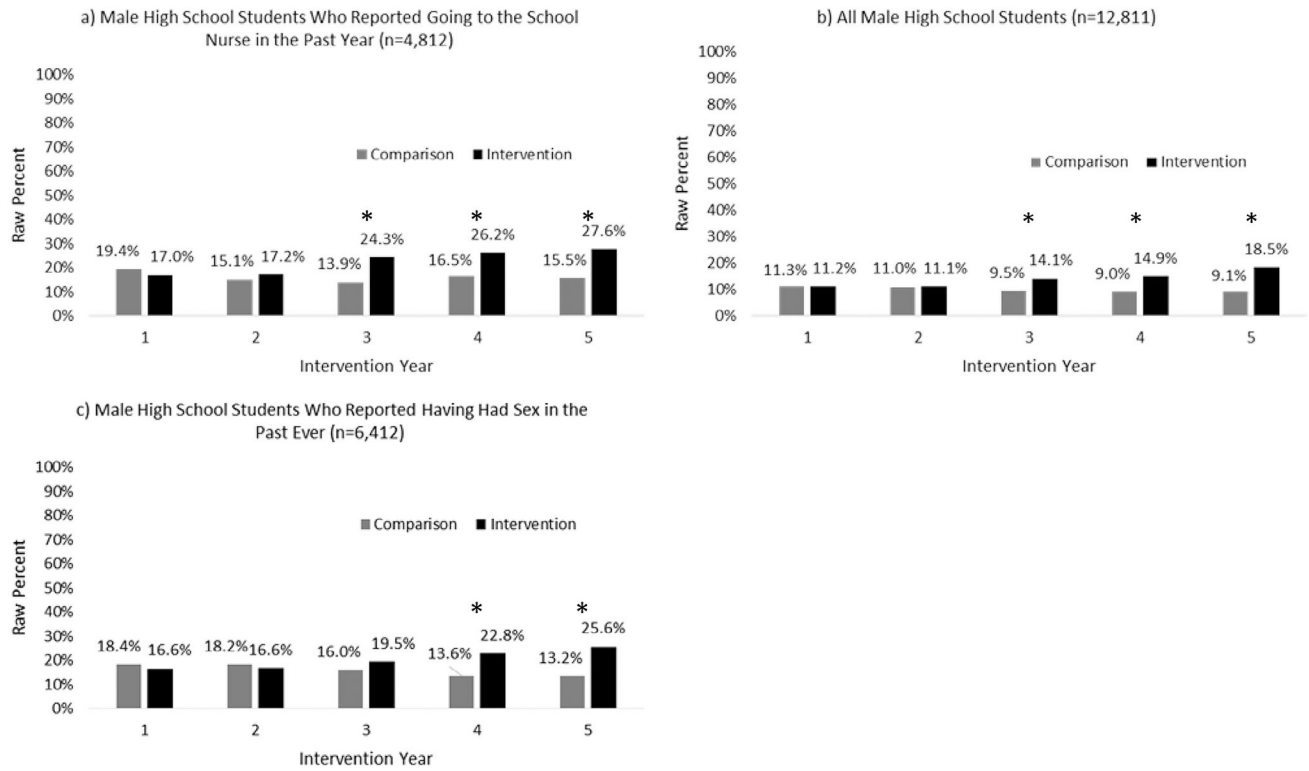
Figure 1.
Raw percentage of male students who went to the school nurse in the past year by intervention group and year of intervention (n = 13,423).
An asterisk indicates a significant difference between intervention and control students for that intervention year (p<.01

Figure 2.

Bar charts for the raw percentage of students who went to the school nurse for either condoms or SRH information in the past year by intervention group and intervention year among (A) male high school students who reported going to the school nurse for any service, (B) all male high school students, and (C) male high school students who ever had sex. An asterisk indicates a significant difference between intervention and control students for that intervention year ($p < .05$).

Table 1

Comparison of sample characteristics between intervention and comparison high school males at T1 (N = 2,709)

Demographic characteristics	Comparison (n = 1,184)		Intervention (n = 1,525)		p
	n	%	n	%	
Race/ethnicity					.067
Latino	1,042	80.5	1,116	83.4	
African–American	112	8.6	111	8.3	
Other	141	10.9	111	8.3	
Grade					.020
9	394	30.4	334	25.0	
10	265	20.4	285	21.3	
11	321	24.7	361	27.0	
12	317	24.4	358	26.8	
Household type					.713
Two parents	885	69.2	911	69.9	
Other	394	30.8	393	30.1	
Generation					<.001
Child and parents foreign born	278	22.0	341	26.2	
Child US born, one or both parents foreign born	774	61.2	847	65.0	
Both parents born in the United States	212	16.8	115	8.8	
Language spoken at home					<.001
English exclusively	357	27.6	232	17.4	
Other language exclusively	377	29.1	418	31.4	
A mixture of languages	560	43.3	680	51.1	
Survey language					<.001
English	1,261	97.1	1,326	99.1	
Spanish	37	2.9	12	.9	
Ever had sexual intercourse					.468
Yes	626	51.4	657	52.8	
No	593	48.6	587	47.2	

Demographic characteristics	Comparison (n =1,184)		Intervention (n =1,525)		p
	n	%	n	%	
Teen pregnancy among siblings					
Yes	203	15.8	210	15.8	.991
No	1,082	84.2	1,118	84.2	
Teen pregnancy among friends					
Yes	353	27.5	356	26.8	.668
No	930	72.5	974	73.2	
Receipt of other health care					
Yes	1,010	78.6	1,046	79.7	.504
No	275	21.4	267	20.3	

Some column totals may not add up to the group total due to missing data.

Table 2

Treatment effect estimates for interaction between the intervention group and time for visiting the school nurse in the past year and receipt of either condoms or SRH information from the school nurse in the past year (GEE model) for all male high school students, sexually experienced male high school students, and male high school students who reported going to the nurse

Subpopulation (n)	Group	Estimated marginal means (standard errr)[a]					Group effect Wald χ^2, df, p	Time × group interaction Wald χ^2, df, p
		t_0	t_1	t_2	t_3	t_4		
Visited the school nurse in the past year								
All high school males (n =11,980)	Comparison	.50 (.03)	.50 (.03)	.45 (.03)	.39 (.03)	.35 (.03)	14.00, df = 1, p < .001	60.15, df = 1, p < .001
	Intervention	.43 (.03)	.37 (.03)	.39 (.03)	.40 (.03)	.43 (.03)		
Receipt of either condoms or SRH information from the school nurse in the past year								
Only high school males who reported going to the school nurse in the past year (n = 4,329)	Comparison	.09 (.03)	.08 (.03)	.06 (.02)	.07 (.03)	.04 (.02)	24.07, df = 1, p < .001	27.39, df = 1, p < .001
	Intervention	.10 (.03)	.07 (.03)	.11 (.04)	.12 (.04)	.15 (.05)		
All high school males (n =11,545)	Comparison	.04 (.01)	.04 (.01)	.03 (.01)	.03 (.01)	.03 (.01)	33.61, df = 1, p < .001	38.89, df = 4, p < .001
	Intervention	.05 (.01)	.04 (.01)	.06 (.02)	.06 (.02)	.07 (.02)		
Only high school males who reported ever having had sex (n = 6,018)	Comparison	.13 (.03)	.13 (.03)	.10 (.03)	.08 (.02)	.09 (.02)	23.00, df = 1, p < .001	38.31, df = 1, p < .001
	Intervention	.12 (.03)	.11 (.03)	.14 (.03)	.17 (.04)	.19 (.04)		

All GEE models control for grade, race/ethnicity, household composition, generation of immigration, language spoken at home, survey administration language, pregnancy of a peer, and any health-care use in the past year. Additionally, findings for all males and only males who went to the school nurse in the past year control for sexual experience.

GEE = generalized estimating equation; SRH = sexual and reproductive health.

[a] Marginal means are based on the original binary scale of the outcomes. t0 refers to the baseline survey.