

**Original Research Article in the *Journal of Adolescent Health* – Author Version**

**Consequences of Sex Education on Teen and Young Adult Sexual Behaviors and Outcomes**

**Laura Duberstein Lindberg, PhD<sup>1</sup>**

**Isaac Maddow-Zimet<sup>1</sup>**

<sup>1</sup> *The Guttmacher Institute, New York City*

Volume 51, Issue 4, October 2012, Pages 332–338

Received 20 September 2011. Accepted 22 December 2011. Available online 7 March 2012.

**doi:10.1016/j.jadohealth.2011.12.028**

The primary author can be contacted at [LLindberg@guttmacher.org](mailto:LLindberg@guttmacher.org).

Abstract available on [Journal of Adolescent Health Web site](#)

**Implications and Contributions:** This study expands on previous research on the association of formal sex education with sexual health and behaviors, and finds that formal sex education that includes instruction about both waiting to have sex and methods of birth control can improve the health and well-being of adolescents and young adults.

## **Abstract**

### **Purpose**

This study examined whether formal sex education is associated with sexual health behaviors and outcomes using recent nationally representative survey data.

### **Methods**

Data used were from 4,691 male and female individuals aged 15-24 from the 2006-08 National Survey of Family Growth. Weighted bivariate and multivariate analyses were conducted by gender, estimating the associations of sex education by type (only abstinence, abstinence and birth control, or neither) before first sexual intercourse, and sexual behaviors and outcomes.

### **Results**

Receipt of sex education, regardless of type, was associated with delays in first sex for both genders, as compared to receiving no sex education. Respondents receiving instruction about abstinence and birth control were significantly more likely at first sex to use any contraception (odds ratio [OR] = 1.73, females; OR=1.91, males) or a condom (OR=1.69, females; OR=1.90, males), and less likely to have an age-discrepant partner (OR=.67, females; OR=.48, males). Receipt of only abstinence education was not statistically distinguishable in most models from

receipt of either both or neither topics. Among female subjects, condom use at first sex was significantly more likely among those receiving instruction in both topics as compared with only abstinence education. The associations between sex education and all longer-term outcomes were mediated by older age at first sex.

## **Conclusions**

Sex education about abstinence and birth control was associated with healthier sexual behaviors and outcomes as compared to no instruction. The protective influence of sex education is not limited to if or when to have sex, but extend to issues of contraception, partner selection, and reproductive health outcomes.

Keywords: Contraception, Teen pregnancy, Sex education, Abstinence, Age at sexual initiation, Sexual behavior

## **Introduction**

Formal sex education—curriculum based programs both in and out of school— is a key strategy for promoting safer sexual behaviors for adolescents and young adults [1]. Between fiscal years 1997 and 2008, the federal government provided more than \$1.5 billion to education programs focused solely on abstinence until marriage. Federal guidance prohibited programs using these funds to discuss contraceptive methods, except to emphasize their failure rates [2]. Paralleling this funding stream, from 1995 to 2002 there were significant increases in the proportion of teenagers receiving instruction only about abstinence (males, 9% to 24%; females, 8% to 21%) and decreases in the proportion receiving instruction about both abstinence and birth control methods (males, 65% to 59%; females, 84% to 65%) [3]. Data from the 2006-08 National Survey of Family Growth (NSFG) indicate that these patterns recently remained stable, leaving many adolescents without formal instruction about birth control (males, 38%; females, 30%) whereas most adolescents received abstinence education (males, 81%; females 87%) [4,5].

These changes in the content of formal sex education occurred without scientific evidence supporting the effectiveness of abstinence-only programs [6]. Although one recent study on younger teens identified some positive impacts of abstinence-only education that promoted delaying the onset of sex [7], it leaves intact the body of evidence in several systematic reviews concluding that abstinence-until-marriage programs are ineffective in delaying sexual debut or reducing sexual risk behaviors among sexually experienced teens [8,9]. In sharp contrast, evaluations of comprehensive sex education programs find greater efficacy; in Kirby's most recent review, two-thirds of 48 comprehensive programs teaching both abstinence and the use of birth control had positive behavioral effects [10].

A handful of studies have examined the influence of sex education at the population level. Three analyses of the 2002 NSFG examined the association between sex education prior to first intercourse and select measures of adolescent sexual behaviors. Kohler et al estimated that receipt of comprehensive sex education was marginally associated with less likelihood of vaginal intercourse and a significantly reduced likelihood of teen pregnancy, but found no association between abstinence-only education and these outcomes [11]. A second study, which did not distinguish between abstinence and comprehensive sex education, found that receipt of sex education was associated with delayed onset of sexual activity among both genders, and increased likelihood of birth control use at first sex among male, but not female, adolescents [12]. Another study of female adolescents found that contraceptive use at first sex did not vary among those receiving abstinence or comprehensive sex education, but did not contrast these findings with no instruction [13].

We used data from the 2006-08 NSFG to extend and refine prior research in a number of important ways. We examined the association between receipt of formal sex education by type and key behaviors during a more recent time period. The 2006-08 NSFG measured sex education among respondents aged 15-24 years, instead of only adolescents, permitting examination of sex education's longer-term impacts. Additionally, we examined a wider range of outcomes, including timing of first sex, contraceptive use, prevention of pregnancy and sexually transmitted infections (STIs), as well as the development of healthy relationships.

## **Methods**

### *Data*

The data analyzed were from the 2006-08 NSFG, a nationally representative household survey of U.S. male and female persons aged 15-44 years. The survey used a multi-stage,

stratified, clustered sampling frame to collect interviews continuously from June 2006 to December 2008. Detailed survey methodology has been described elsewhere [14]. Information about the receipt of formal reproductive health education was collected in face-to-face interviews from respondents aged 15-24 years. An audio, computer-assisted, self-administered interview contained items on sensitive topics, including pregnancy and STIs.

### *Measures*

*Formal Instruction.* Respondents aged 15-24 years were asked whether they had received formal instruction before age 18 years on “how to say no to sex,” or “methods of birth control” and the grade of first receipt of each. We added five years to the reported grade to estimate age at first receipt [15]. Comparing age at instruction and age at first sex, we calculated whether instruction was received before first vaginal intercourse.

We combined these responses into a categorical variable for sex education received before first sex: “how to say no” only, both “how to say no” and birth control (Ab+BC), or neither topic. Past studies using NSFG data have categorized receipt of instruction about both “how to say no” and birth control methods as comprehensive sex education [3,11,13]. However, this no longer seems appropriate, given the recognition that abstinence programs may highlight the ineffectiveness of contraceptive methods. As we do not have information about the content or tone of instruction about birth control methods, we cannot label these as comprehensive instruction that would teach about birth control methods as a means to prevent pregnancy.

*Dependent Variables.* Twelve dependent variables related to young people’s sexual and reproductive health (SRH) behaviors and outcomes were examined. For each measure we created

a dichotomous indicator (0 = no, 1 = yes). Measures referring to first vaginal sexual intercourse include timing of first sex, contraceptive use at first sex and condom use at first sex. Partnership measures at first sex include with a romantic partner (vs. a casual partner), with an age-discrepant partner (age difference of 3 years or more in either direction), or unwanted first sex (respondents agreed with the statement, "I really didn't want it to happen at the time"). Lifetime and current SRH indicators measured at the time of the interview included having had six or more sexual partners, ever been (or gotten a partner) pregnant, STI treatment in the past 12 months, and contraceptive use at last sex (any effective method or condom use). The first three incorporated audio, computer-assisted, self-administered interview reports.

*Sociodemographic Variables.* Each model included measures of age at interview (integer ages: 15-24 years), race/ethnicity, poverty level, mother's education, living arrangements at age 14 years, frequency of attendance at religious services at age 14 years, and community type. Models referring to the time of the interview included measures of current union status.

### *Analytical Approach*

The analytical sample was limited to respondents aged 15-24 years at the time of the interview. We excluded respondents who reported age of first intercourse before age 10 years ( $n=12$ ). Following the approach of Kohler et al, we also excluded respondents reporting only receiving formal birth control instruction without mentioning abstinence ( $n=366$ ), as well as 14 cases with missing information on sex education. After these exclusions, the total sample comprised 2,505 female and 2,186 male individuals aged 15-24 years.



All analyses were conducted separately by gender. Analyses were weighted and use the *svy* command prefix in Stata 11.1 (StataCorp, College Station, TX) to adjust for the complex survey design of the NSFG. Bivariate analyses using  $\chi^2$  tests examined associations between receipt of sex education and 1) the sociodemographic covariates and 2) the SRH behaviors and outcomes. Kaplan-Meier survival curves, stratified by receipt of formal sex education, were used to examine the bivariate association between type of sex education and the timing of the transition to first sex.

We estimated multivariate discrete-time logistic hazard rate models of the association between type of sex education and the transition to first sexual intercourse before age 20 years, incorporating censored cases. Separate observations, or person-years, were created for each year that a respondent was at risk of having first sex; data were censored for respondents who have not had sex or not reached the completed age by the time of interview. Time was measured as a series of single-year categorical variables indicating respondent's age at each person-year, allowing the risk of initiation of sexual activity to vary with age. Socio-demographic variables were included as fixed covariates.

Next, we estimated multivariate logistic regression models of the association between formal sex education received before first intercourse and the other SRH behaviors and outcomes. Models estimating characteristics of first intercourse were limited to sexually experienced respondents with nonmissing data on the timing of sex education (n= 1,647 females, n=1,360 males). Models estimating lifetime and current measures were limited to never-married sexually experienced respondents with nonmissing data (n=1,383 females, n=1,242 males); for ever-married respondents, the health and well-being implications were unclear. In all models, type of sex education was included as a categorical variable. For each outcome, we estimated

two nested models, the first including all socio-demographic covariates and the second controlling for age at first sex. Controlling for both age at interview and age at first sex also controls for duration of time since first sex.

## **Results**

### *Bivariate*

Two-thirds of sexually experienced females and 55% of sexually experienced males received Ab+BC prior to first vaginal sex (Table 1). About one in five respondents reported receiving only abstinence education before first sex. Sixteen percent of sexually experienced female and 24 % of sexually experienced male respondents reported not receiving instruction in either topic before first sex. Receipt of sex education varied significantly by most of the covariates examined, with receipt of neither topic more common among respondents who were black or Hispanic, who were living in a poorer household, whose mothers had lower education, who were not living with two parents at age 14 (females only), and who attended religious services less frequently (females only). For both genders, healthier behaviors and outcomes were generally positively associated with receipt of sex education of either type, whereas riskier behaviors were more likely among respondents not receiving instruction in neither topic (Table 2).

Figures 1A and 1B illustrate the failure curves of onset of first vaginal sex, before age 20 years, by receipt of sex education. For both genders, the timing of first vaginal sex had significantly earlier onset among those reporting no sex education. The curves for receiving only abstinence or Ab+BC were severely overlapping and indistinguishable on the graph. Before turning age 20, 86% of female and 88% of male respondents without sex education had vaginal

sex; in contrast, among those receiving only abstinence or Ab+ BC, 77-78% had sex before age 20 years.

### *Multivariate*

*Initiation of vaginal sex.* After adjusting for other socio-demographic covariates of engaging in vaginal intercourse, and adjusting for censoring, receipt of either only abstinence or Ab+BC education (as compared to not receiving instruction on either topic) significantly delayed the transition to first vaginal sex (Table 3). The magnitude of the associations was greater for male than for female respondents. However, for both genders, there were no significant differences in the timing of first sex between those receiving only abstinence or Ab+BC instruction.

*Contraceptive use at first sex.* In Model 1, female respondents reporting receipt of Ab+BC were significantly more likely to have used any contraception (adjusted odds ratio [OR<sub>adj</sub>]=2.01) or a condom (OR<sub>adj</sub> =1.62) at first sexual intercourse than those not receiving sex education. There was no significant association with receipt of only abstinence education. Among males, in model 1, receipt of only abstinence education and Ab+BC were each significantly associated with an increase in the likelihood of using any contraception or a condom at first sex. However, after controlling for age at first sex in model 2, only receipt of Ab+BC was significantly associated with increased contraceptive use and condom use at first sex for both male and female respondents. Compared to female respondents receiving Ab+BC, those reporting receipt of only abstinence education were significantly less likely to use a condom at first sex in both model 1 and model 2; among male respondents, there were no significant differences in contraceptive or condom use between the two types of instruction.

*First partnership characteristics.* In the first set of models (model 1), receipt of Ab+BC was significantly associated with a reduced likelihood of having an age-discrepant partner among females as compared to either receipt of only abstinence or no instruction. Among males in model 1, compared with no instruction, receipt of Ab+BC ( $OR_{adj} = .36$ ) or only abstinence ( $OR_{adj} = .45$ ) significantly reduced the likelihood of having an age-discrepant partner; there was no significant difference between these two categories of instruction. In both model 1 and model 2, receipt of Ab+BC reduced the likelihood of reporting that first sex was unwanted by more than half among female respondents; the association was negative among male respondents, but not statistically significant at conventional levels ( $p = .06$ ). In model 1, male respondents receiving either only abstinence ( $OR_{adj} = 1.59$ ) or Ab+BC ( $OR_{adj} = 1.85$ ) were significantly more likely to have a romantic partner at first sex; there was no significant association among female respondents. In model 2, the associations for male respondents were no longer significant.

*Lifetime and Recent SRH Outcomes and Behaviors.* In model 1 of Table 4, Ab+BC was associated with reductions in the likelihood of having 6 or more partners for both genders; receipt of only abstinence education was negatively associated only among male respondents. After controlling for age at first sex in model 2, none of these associations remained statistically significant. Similarly, among male respondents, in model 1, Ab+BC was significantly associated with ever making a partner pregnant ( $OR_{adj} = .49$ ), condom use at last sex ( $OR_{adj} = 1.86$ ), and recent STI treatment ( $OR_{adj} = .44$ ). However, after controlling for age at first sex in model 2, none of these relationships were statistically significant. In contrast, among female respondents,

models 1 and 2 showed no significant associations between sex education and pregnancy, STI treatment or contraceptive or condom use at last sex. The two sets of models indicate that Ab+BC indirectly influenced recent behaviors among male respondents through delaying first sex, but had no significant association with recent behaviors for females. In none of the models was there a significant difference between receipt of only abstinence and Ab+BC.

## **Discussion**

In this study, receipt of formal sex education before first sex, particularly that including instruction about both delaying sex and birth control methods, was associated with a range of healthier outcomes among adolescents and young adults as compared with not receiving instruction in either topic. Receipt of Ab+BC was associated with delayed onset of first sex, greater use of contraception or condoms at first sex and healthier partnerships at first sex. Associations between Ab+BC and longer term outcomes were only indirect, operating through older age at first sex, particularly among male respondents, reducing their likelihood of having gotten a partner pregnant, multiple partnerships, and recent STI treatment, and increasing the likelihood of condom use at most recent sex.

For the nearly 20% of adolescents and young adults who reported receipt of only abstinence education, we found few clear significant associations between this instruction and SRH behaviors and outcomes. Receipt of only abstinence education, without additional instruction about birth control, was associated with delayed onset of vaginal sex. Across the other behaviors and outcomes examined, receipt of only abstinence education rarely had a direct association with the SRH measures. Additionally, in most models receipt of only abstinence education was statistically indistinguishable from the each of the other categories of sex

education (Ab+BC or neither topic). However, females receiving Ab+BC were significantly more likely than those receiving only abstinence education to use a condom at first sex, suggesting that more comprehensive sex education better promoted condom use.

We believe that the lack of many significant differences between receipt of only abstinence and Ab+BC derive at least in part from our inability to identify details of the instruction about birth control measured in the NSFG. Reported birth control instruction may promote the use of contraception or only discuss failure rates and ineffectiveness as required by federal abstinence-until-marriage legislation. We expect that reports of receipt of BC instruction fall into both camps, diminishing the “real world” differences between our analytical categories. Future efforts to measure receipt of sex education must better distinguish the tone and content of birth control instruction.

Contrary to some critics of formal sex education, we found no evidence that receipt of either type of sex education was associated with earlier onset of sex, greater risk taking, or poorer SRH outcomes. Even when the estimated associations were not statistically significant at conventional levels, the direction of association was consistently towards less healthy SRH behaviors and outcomes among those who did not receive instruction in either abstinence or birth control before first sex. As both receipt of Ab+BC or only abstinence education significantly increased age at first sex, it appears that talking with adolescents about sex – before they first have sex—seems to be what is important, regardless of the specific subject matter.

This study is among the first to demonstrate associations between sex education and selection of partners. Unwanted first sex and age-discrepant partnerships are associated with poorer reproductive health outcomes, including STIs, pregnancy and less contraceptive use [16-19]. Further research should work to identify and strengthen the mechanisms underlying the

links between sex education and first partnerships, whether through decision making and selection or less exposure to riskier situations, such as alcohol or drug use before sex.

Our efforts to examine longer-time effects of sex education revealed patterns of indirect associations, as the association between sex education and longer-term outcomes was substantially moderated by age at first sex. In general we found that male respondents were more likely than female respondents to have an indirect association between the sex education they received before first sex and longer-term outcomes or behaviors. This likely reflects that fact that for male adolescents and young adults, there are fewer opportunities to supplement their initial formal sex education, since they are more likely to be out of school and less likely to have contact with the health care system. Together this speaks to the need for sex education beyond initial classroom instruction as well as linkages to reproductive health care services. Health care providers, who are a highly trusted source of information among this age group, can supplement and refresh previous formal instruction [20]. Increasing access is imperative, especially for young men, who are substantially less likely to talk with a health care provider about sexual health issues.

The significant socio-demographic differentials in the receipt of sex education before first sex are troubling. Nearly one-third of young men of color did not receive instruction on either abstinence or birth control methods before first sex. Among both males and females, receipt of Ab+BC was less likely among those who were from a lower-income group, had lower maternal education, or were black or Hispanic; these demographic groups have poorer SRH outcomes, including higher rates of STIs and teen pregnancy, highlighting the unmet need for formal instruction in sex education.

The findings reported here face a number of limitations. The measures of receipt of instruction are limited, in that they only report if any instruction occurred, but tell us nothing about other important aspects of the education, such as its quantity, quality or specific content. Additionally, these self-reported measures of reproductive health instruction reflect adolescents' recall of such instruction. Finally, observational studies such as this always face challenges in ascribing causality. Our results are strengthened by the use of multivariate models which control for a range of socio-demographic characteristics temporally distant from the outcomes which may be correlated with both sex education and the outcomes under study. Additionally, our investigation of multiple outcome measures offers validation of general patterns. [21]

This study demonstrated that formal sex education which includes instruction about both waiting to have sex and methods of birth control can improve the health and well-being of adolescents and young adults. The protective influence of sex education is not limited to the questions of if or when to have sex, but extend to issues of partner selection, contraceptive use, and reproductive health outcomes. Creating access to medically accurate comprehensive sex education, and reducing socio-demographic disparities in its receipt, should remain a primary goal for improving the well-being of teens and young adults. At the same time, recognizing that maintaining SRH is an ongoing process, access to relevant information, services and support should remain available over the course of a lifetime.

## **Acknowledgements**

The authors thank Lawrence Finer for technical assistance and reviewing several drafts of the article. The research on which this article is based was supported by The California Wellness



Foundation. The conclusions and opinions expressed here are those of the authors and not necessarily those of the funder.

## Reference List

1. U.S. Department of Health and Human Services. Healthy People 2010: Understanding and Improving Health. Washington, DC: U.S. Department of Health and Human Services, Government Printing Office, 2000.
2. HHS, Health Resources and Services Administration, Maternal and Child Health Bureau, *Special Projects of Regional and National Significance (SPRANS) Community-Based Abstinence Education Project Grants, HRSA-04-077, Catalog of Federal Domestic Assistance (CFDA) No. 93.110, FY 2004 Program Guidance Competing Announcement, 5.*
3. Lindberg LD, Santelli JS, Singh S. Changes in formal sex education: 1995-2002. *Perspect Sex Reprod Health* 2006;38:182-189.
4. Lindberg, L. & Maddow-Zimet, I. (2011). Monitoring trends in sex education and information. *Journal of Adolescent Health* 48[2], S105-S106.
5. Martinez G, Abma J and Copen C. Educating Teenagers About Sex in the United States. Hyattsville, MD: Department of Health and Human Services, 2010.
6. Trenholm C, Devaney B, Fortson K, Quay L, Wheeler J, Clark M. Impacts of Four Title V, Section 510 Abstinence Education Programs: Final Report. Princeton, NJ: Mathematica Policy Research, 2007.
7. Jemmott JB, III, Jemmott LS, Fong GT. Efficacy of a theory-based abstinence-only intervention over 24 months: a randomized controlled trial with young adolescents. *Arch Pediatr Adolesc Med* 2010;164:152-159.
8. Bennett SE, Assefi NP. School-based teenage pregnancy prevention programs: a systematic review of randomized controlled trials. *J Adolesc Health* 2005;36:72-81.
9. Underhill K, Montgomery P, Operario D. Sexual abstinence only programmes to prevent HIV infection in high income countries: systematic review. *BMJ* 2007;335:248.
10. Kirby DB. The impact of abstinence and comprehensive sex and STD/HIV education programs on adolescent sexual behavior. *Sex Res and Social Policy* 2008;5:18-27.
11. Kohler PK, Manhart LE, Lafferty WE. Abstinence-only and comprehensive sex education and the initiation of sexual activity and teen pregnancy. *J Adolesc Health* 2008;42:344-351.
12. Mueller TE, Gavin LE, Kulkarni A. The association between sex education and youth's engagement in sexual intercourse, age at first intercourse, and birth control use at first sex. *J Adolesc Health* 2008;42:89-96.

13. Isley MM, Edelman A, Kaneshiro B, et al. Sex education and contraceptive use at coital debut in the United States: results from Cycle 6 of the National Survey of Family Growth. *Contraception* 2010;82:236-242.
14. Lepkowski JM, Mosher WD, Davis KE, Groves RM, VanHoewyk J. The 2006–2010 National Survey of Family Growth: Sample Design and Analysis of a Continuous Survey . Hyattsville, MD: National Center for Health Statistics, 2010.
15. Lindberg LD, Ku L, Sonenstein F. Adolescents' reports of reproductive health education, 1988 and 1995. *Fam Plann Perspect* 2000;32:220-226.
16. Senn TE, Carey, MP. Age of partner at first adolescent intercourse and adult sexual risk behavior among women. *J Women's Health* 2011; 20:61-66.
17. Manlove J, Ryan S, Franzetta K. Patterns of contraceptive use within teenagers' first sexual relationships. *Perspect Sex Reprod Health* 2003;35: 246-255.
18. DiClemente RJ, Wingood GM, Crosby RA, et al. Sexual risk behaviors associated with having older sex partners: a study of black adolescent females. *Sex Transm Dis* 2002;29: 20-24.
19. Darroch JE, Landry DJ, Oslak S. Age differences between sexual partners in the United States. *Fam Plann Perspect* 1999;31:160-167.
20. Kaye K, Suellentrop K, Sloup C. *The Fog Zone: How Misperceptions, Magical Thinking, and Ambivalence Put Young Adults at Risk for Unplanned Pregnancy*. Washington, DC: The National Campaign to Prevent Teen and Unplanned Pregnancy, 2009.
21. Lindberg LD, Orr M. Neighborhood-level influences on young men's sexual and reproductive health behaviors. *Am J Public Health* 2011;101:271-274.

**Table 1**

Receipt of sex education before first sex by topic, among sexually experienced females and males aged 15-24 years, by selected characteristics (weighted), 2006-2008 National Survey of Family Growth

Characteristic	Females				Males			
	Type of sex education			<i>p</i>	Type of sex education			<i>p</i>
	Abstinence and birth control (%)	Only abstinence (%)	Neither (%)		Abstinence and birth control (%)	Only abstinence (%)	Neither (%)	
<b>All sexually experienced</b>	66	18	16		55	21	24	
<b>Age at interview</b>								
Age 15-17 years	59	25	16		52	24	25	
Age 18-19 years	69	17	13	.41	46	29	25	.09
Age 20-24 years	66	17	16		58	18	24	
<b>Race/ethnicity</b>								
Hispanic	62	15	23		47	21	32	
Non-Hispanic white	68	19	13	.08	60	21	19	<.01
Non-Hispanic black	61	20	19		44	22	34	
Other	74	19	7		72	12	16	
<b>Household poverty status</b>								
<100%	64	19	17		42	18	40	
100-199%	62	16	22	.05	50	27	23	<.01
>=200%	70	19	11		62	20	18	
<b>Mother's education</b>								
< High School	58	17	26		39	25	36	
High School or GED	66	16	17	<.01	51	24	25	.01
Some college or more	70	20	10		63	18	19	
<b>Living arrangements at age 14 years</b>								
Both biological/adoptive parents	69	19	12	.01	57	20	23	.43
Other	62	17	21		51	22	27	
<b>Religious attendance at age 14 years</b>								
Never	69	11	20		61	12	28	
Sometimes	64	18	18	.05	58	19	23	.14
Often	66	21	13		51	25	23	
<b>Community Type</b>								
Suburban	68	17	15		57	22	21	
Urban	63	20	17	.76	55	17	29	.21
Rural	67	18	15		51	26	22	

GED = general educational development

**Table 2**

Percent of females and males aged 15-24 years engaging in select SRH behaviors and outcomes, by type of sex education before first sex, 2006-2008 National survey of Family Growth (NSFG)

SRH behaviors and outcomes	Females					Males				
	Type of Sex Education					Type of Sex Education				
	Total (%)	Abstinence and birth control (%)	Only abstinence (%)	Neither (%)	<i>p</i>	Total (%)	Abstinence and birth control (%)	Only abstinence (%)	Neither (%)	<i>p</i>
<u>First vaginal intercourse<sup>a</sup></u>										
Used contraception	75.7	79.7	73.7	60.8	<.01	82.0	85.8	85.6	69.9	<.01
Used condom	65.8	70.3	58.3	55.4	<.01	77.5	80.7	79.9	68.3	<.01
Sex unwanted	8.7	6.9	7.9	17.6	<.01	5.6	3.2	5.5	11.0	.01
Age-discrepant partner	30.0	26.3	34.6	40.6	.01	13.0	9.9	11.3	21.8	.01
Romantic partner	75.8	78.3	71.5	70.1	.11	57.3	62.7	58.7	43.6	<.01
<u>Lifetime and current outcomes<sup>b</sup></u>										
Ever pregnant	34.7	31.5	28.6	54.8	<.01	21.9	16.6	20.9	34.4	<.01
Six or more partners	26.1	22.9	25.1	40.7	<.01	39.7	34.5	32.6	57.2	<.01
Recent STD treatment	8.7	7.1	11.2	12.6	.12	4.2	2.9	4.4	6.7	.08
<u>Behaviors at last sex<sup>b</sup></u>										
Used contraception	74.5	77.3	69.9	67.9	.16	85.8	88.1	87.8	80.0	.12
Used condom	48.6	51.8	50.1	33.8	.03	64.9	68.8	68.6	55.1	.09

SRH = sexual and reproductive health; STI = sexually transmitted infection.

<sup>a</sup> among respondents who had vaginal intercourse.

<sup>b</sup> among never-married respondents who had vaginal intercourse.

**Table 3**

Results of multivariate logistic regressions of associations between characteristics of first sex and type of sex education, by gender, in females and males aged 15-24 years, 2006-2008 National Survey of Family Growth (NSFG)<sup>a</sup>

Characteristic	Transition to first sex before age 20 years	Any effective contraceptive use <sup>bc</sup>		Condom use <sup>b</sup>		Sex unwanted <sup>b</sup>		Age discrepant partner <sup>b</sup>		Romantic partner <sup>b</sup>	
		Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR
<b>Females</b>											
Sex education before first sex											
Abstinence and birth control	0.54**	2.01**	1.73*	1.62*	1.69*	0.40**	0.46*	0.64*	0.67*	1.41	1.17
Only abstinence (Neither)	0.62*	1.36	1.19	0.92^	0.95^	0.50	0.54	1.06^	1.11	0.94	0.80
Age at first sex (linear)			1.15**		0.97		0.86**		0.96		1.17**
<b>Males</b>											
Sex education before first sex											
Abstinence and birth control	0.41**	2.60**	1.91*	2.13**	1.90*	0.39	0.34	0.36**	0.48*	1.85**	1.41
Only Abstinence (Neither)	0.38**	2.46**	1.90	1.88*	1.69	0.59	0.51	0.45*	0.60	1.59*	1.24
Age at first sex (linear)			1.22*		1.06		1.18		0.78**		1.22**

OR = odds ratio.

<sup>a</sup>All models also control for age at interview, race/ethnicity, household poverty status, mother's education, community type, living arrangements at age 14 years, and religious attendance at age 14 years.

<sup>b</sup> Among respondents who had vaginal intercourse.

<sup>c</sup> For the purposes of this analysis, withdrawal was not included as a contraceptive method.

\* p<=.05.

\*\*p<=.01.

^ p<=.05 between "abstinence and birth control" and "only abstinence."

**Table 4**

Results of multivariate logistic regression of associations between lifetime SRH outcomes and type of sex education, by gender, in unmarried sexually experienced females and males aged 15-24 years, 2006-2008 National Survey of Family Growth<sup>a</sup>

Lifetime SRH outcomes	Six or more partners		Ever pregnant		Any effective contraceptive use at last sex <sup>b</sup>		Condom use at last sex	STI treatment in last 12 months		
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR
<b>Females</b>										
Sex education before first sex										
Abstinence and birth control	0.47**	0.88	0.64	1.00	0.99	0.88	1.49	1.18	0.80	1.17
Only abstinence (Neither)	0.72	1.06	0.52	0.70	0.63	0.59	1.39	1.21	1.54	2.02
Age at first sex (linear)		0.55**		0.64**		1.11		1.29**		0.72**
<b>Males</b>										
Sex education before first sex										
Abstinence and birth control	0.32**	0.60	0.49*	0.86	1.31	1.16	1.86*	1.58	0.44*	0.73
Only abstinence (Neither)	0.35**	0.54	0.53	0.82	1.90	1.71	1.74	1.57	0.54	0.77
Age at first sex (linear)		0.62**		0.71**		1.10		1.14*		0.70**

<sup>a</sup>All models also control for cohabitation status, age at interview, race/ethnicity, household poverty status, mother's education, region, residence at age 14 years, and religious attendance at age 14 years.

<sup>b</sup> For the purposes of this analysis, withdrawal was not included as a contraceptive method.

\* p<=.05

\*\*p<=.01

**Figure 1**

The failure curves of onset of first sex, before age 20 years, by receipt of sex education, among (A) females aged 15-24 years and (B) males aged 15-24 years.

