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Exploring the Effect of Sexual Education on Sexual Health Risk Behaviors: Analysis of the 2003 and 2007 Youth Risk Behavior Surveys in Florida and Alabama

Shenena Armstrong, MPH, Alicestine Ashford, EdD, MPH, Ivette A. López, PhD, MPH, C. Perry Brown, DrPH

ABSTRACT

The purpose of this study was to explore the relationship between sexual health education content and sexual health risk behaviors, and the mediating effect of demographic variables. A cross-sectional research design employing secondary data analysis explored these associations in a sample of African American and non-Hispanic White male and female adolescents that took part in the Youth Risk Behavior Survey (YRBS) for the years 2003 and 2007 in the aforementioned southern states. Significant associations were observed between race and reported condom use and alcohol and/or drug use during last intercourse. For both Alabama and Florida, sexual health education was associated with reported condom usage as well as alcohol and/or drug use at last sexual intercourse. Those receiving sexual education of either type were more likely to report using a condom at their last sexual encounter, and less likely to report alcohol and/or drug use. However, the multivariate analysis did not support all of the findings of the bivariate analysis for both reported condom and alcohol and/or drug use. These findings suggest there is need for continued sexual education in this vulnerable demographic group.

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Introduction

There is general consensus that sexual education for adolescents between 13 and 19 years of age is an important experience that schools should provide. However, the agreement stops there, and the debate begins. Should the content of the education be abstinence-only, abstinence-plus, or comprehensive? The results of recent research determined that American adults, regardless of political persuasion, favored a more balanced approach to sex education than the federally-funded abstinence-only programs of the past decade (Bleakeley, Hennessy, & Fishbein, 2006). Politically conservative participants supported comprehensive sex education (70%) over abstinence-only education (47%) (Bleakeley et al., 2006).

Because the primary aim of school-based sex education is to provide appropriate information to assist in making wise decisions, the choice of appropriate and effective sex education policies is important. In the U.S., AIDS and human immunodeficiency virus (HIV) infection increased by 10% among 15-24 year-olds between 2000 and 2003 (CDC, 2004). These data also indicated that by 15 years of age, 25.1% of youth have had vaginal sex and this increases to 37.5% at 16 years of age and 46.9% by 17 years of age (CDC, 2004). Further, the CDC also reported that one in four girls and women in the U.S. between the ages of 14 and 19 is infected with a sexually transmitted infection (STI). This

national representative CDC study found that one in four teenage girls has a sexually transmitted disease (CDC, 2008). Timely and informative sex education in middle and high schools is an important component to the public health goal of promoting safe behaviors and preventing additional pregnancies, such as condom use (Bleakeley, et al, 2006). Nationally, there is a decreasing trend in condom use among adolescents between 1991 and 2007. In 2007, 39% of currently sexually active high school students did not use a condom during their last sexual intercourse (CDC, 2009).

The 2005 Florida Youth Risk Behavior Survey showed that students in grades 9-12 comprised 50.5% of the students having ever had sexual intercourse (FL DOH, 2006); the Alabama Youth Risk Behavior Survey presented similar findings of 50.6% (AL DOE, 2006). These results indicated that 8.8% of Alabama and Florida high school youth had engaged in their first sexual intercourse by age 13 (FL DOH, 2006; AL DOE, 2006).

In 2007, a review of state sex and STI/HIV education policies by the Guttmacher Institute listed Florida as one of 20 states that mandates that public schools teach sex education, and one of 23 states that require abstinence to be stressed when taught as a part of sex education (FL DOH, 2006). Alabama is one of 35 states that mandate STI/HIV Education, one of 26 states that require that abstinence be covered, and one of 17 states that require that

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STI/HIV programs cover contraception (AL DOE, 2006).

Alabama and Florida have mandated sexual education policies (SEICUS, 2006). Whereas Alabama has a comprehensive human sexuality education policy, Florida has an abstinence-only human sexuality education policy. In Alabama, the State Board of Education adopted the Alabama Course of Study Health Education authorized by the State Code 16-35-5 (SEICUS, 2006). This code specifies, “any program or curriculum in the public schools in Alabama that includes sex education or the human reproductive process, shall as a minimum, include and emphasize abstinence as the only completely effective method that will prevent HIV, STIs, and pregnancy (SEICUS, 2006). Alabama also requires the inclusion of the latest medical information that indicates the reliability and unreliability of various forms of contraception, while also emphasizing the increase protection against HIV, STDs, and pregnancy due to the use of various contraceptive measures including condom use (SEICUS, 2006). Conversely, Florida’s sexual-education policy only mentions contraceptives in regards to it failure rates. The Florida policy emphasizes abstinence from sexual activity as the only certain way to avoid out-of-wedlock pregnancy, sexual transmitted diseases (STD), and other associated health problems (SEICUS, 2006).

Adolescent pregnancy trends in the recent decade have declined. Whereas some abstinence-only advocates have attempted to take credit, recent research rejects that conclusion. Mathematica Policy Research, Inc. reviewed four abstinence-only programs, following students for four to six years. Its study concluded that there was no evidence that abstinence-only programs reduced the rate of teen sexual activity (Trentholm, Devaney, Fortson, Quay, Wheeler, & Clark., 2007). A review of abstinence-only programs concluded there is not strong evidence that abstinence-only programs either delay sex or reduce teen pregnancies (Kirby, 2002). In 2008, the General Accounting Office (GAO) concluded that most abstinence-until-marriage programs are not reviewed in a scientifically acceptable manner (GAO, 2006). The sex education controversy remains active as national research studies have not provided evidence that defines which educational information can, in the end, promote safer sexual practices.

This study explores the association between type of sexual education provided to Alabama and Florida adolescents, alcohol or drug use, and condom use during the last sexual intercourse. Also, the study attempts to determine which policy, abstinence-only (Florida) or comprehensive (Alabama), contributes to

protect sexual health in those states.

Methods

Data Collection Methods

Secondary data were used in a cross-sectional research design. Data were collected for years 2003 and 2007 using the Youth Risk Behavior Survey of the Florida Department of Health, Bureau of Epidemiology, and the Alabama Department of Education, Coordinated School Health Program. Florida’s data collection for the YRBS does not include directly funded local-level data from Broward, Hillsborough, Miami-Dade, Orange, and Palm Beach counties (the most population-dense counties in Florida). The YRBS is based on a two-stage cluster probability sample design. First, a random sample of public high schools is selected for participation in the survey. Second, a random sample of classrooms was chosen within each selected high school, and all students in those classes are invited to participate in the survey. The responses of the survey are weighted to be representative of Alabama and Florida public high school students. All students in grades 9-12 in public high schools were eligible to participate. The survey was anonymous with only a school and class code used for CDC reporting purposes.

Research Questions and Hypothesis

The research questions were: What is the association between using a condom during last intercourse and demographic variables such as age, gender and race? What is the association between the use of alcohol or drugs and the last sexual intercourse? What is the association between type of sexual education exposure and using a condom during last intercourse? The study hypothesis was that there will be a positive association between comprehensive sexual education and sexual health risk behavior outcomes.

Participants

The total number of study participants in the Alabama and Florida YRBS included 5,168 in 2003 and 7,020 respectively in 2007 (Table 1). Subjects were black and white students in Alabama and Florida. Black students represented 33% (n=823) and 31% (n=1,701) in Alabama and Florida, respectively. White students represented 67% (n=1,651) and 69% (n=3,860) in Alabama and Florida, respectively. Both Alabama (n=1,465 and n=1,310) and Florida (n=4,481 and n=4,054) reported 47% female and 53% males. The study population included ages ranging from less than or equal to 14 years old to 18 years old and older. This research was approved by Florida Agricultural and Mechanical University’s institutional review board for the rights of human subjects in research. The study was exempt from full

IRB review because it involved secondary data analysis on data which do not include personal identifiers.

Measures

The measures employed in this study were: sexual education exposure, alcohol and/or drug usage, condom use during last intercourse and demographic variables. Sexual education exposure refers to the type of educational content students received. Alabama and Florida high school students were asked, *Have you ever been taught AIDS or HIV infection in school?* Sexual education exposure was

coded dichotomously as ever or never received Abstinence (Florida) or Comprehensive (Alabama) education. Four behavioral outcomes were included in the analysis. Alcohol and/or drug usage, and condom use during last sexual intercourse was also nominally dichotomized as “yes” or “no” regarding alcohol and/or drug usage or wearing a condom during last intercourse. Finally, three demographic covariates were used in this analysis. Age at interview was coded as a continuous variable while race and gender were treated as categorical.

Table 1: Study Population Characteristics¹

Characteristic	Alabama	Florida
Race		
Black	823 (33%)	1701 (31%)
White	1651 (67%)	3860 (69%)
Gender		
Female	1465 (47%)	4481 (47%)
Male	1310 (53%)	4054 (53%)
Age		
≤ 14 years old	216 (8%)	756 (9%)
15 years old	12 (22%)	2168 (25%)
16 years old	181 (27%)	2384 (28%)
17 years old	608 (25%)	2070 (24%)
≥ 18 years old	770 (18%)	1195 (14%)
Formal Sexual Education		
Received	2969 (86%)	7392 (88%)
Not Received	465 (14%)	976 (12%)

¹Percentages in parentheses

Data Analysis

Data was weighted to adjust for varying probabilities of selection and non-response. All analyses were conducted using the statistical software SPSS 11. Bivariate analyses were focused on the association between education exposure variable, alcohol and/or drug usage, condom use during last intercourse, the demographic covariates and the sexual education exposure. We also examined the exposure variable and the dichotomized behavioral outcomes: age at first sexual intercourse, alcohol or drug use before last sexual intercourse, and condom use during last sexual intercourse. These relationships were examined using a Chi-square test.

Results

Alabama and Florida respondents had similar racial, gender and age distribution composition. Formal sex education was received by 86% of Alabama respondents and 88% of Florida respondents.

Bivariate Analyses

Table 2 displays the association between reported condom use during last sex (outcome variable) and demographic covariates and sexual education exposure by year (independent variables). In 2003 and 2007 for Alabama and Florida there was a significant association between race and ever having sex among all study participants. The associations of state, survey year, demographic

variables, and condom use at last sexual encounter are shown in Table 2. In Alabama in 2003, a significant association was seen between black and white youths who reported “yes” to the question (72% and 59% respectively). This association also held for the 2007 survey. No significant differences in condom use were observed for gender during both survey years. There was a significant progressive decrease in condom use with age during both survey years. Condom use at last sex was reported more often by those receiving the comprehensive sex education than those receiving abstinence-only education. The proportions were not statistically significant. In Florida, significant associations between race and condom use at last sex was

observed for both survey years. In 2003 a slightly larger proportion of whites (77%) reported use compared to blacks (75%). However, in the 2007 survey the proportion of blacks and whites reporting the use of condoms was equal. The proportions of males and females reporting the use of condoms was significantly different in both survey years. Similar to Alabama, there was a significant decline in condom use with age in the 2003 survey (89% among those ≤14 years to 53% in those ≥18 years of age). A similar trend was seen in the 2007 survey. There was a significant difference in the proportion of youth who reported condom use who received sex education and who reportedly did not. This relationship held in 2003 and 2007.

Table 2: Bivariate Associations by State, Year, Reported Sexual Activity and Demographic Variables and Condom Use at Last Sex¹

Characteristic	Alabama		Florida	
	2003	2007	2003	2007
Race	**	**	**	
Black	97 (72)	208 (55)	974 (75)	960 (89)
White	214 (59)	234 (67)	287 (77)	274 (89)
Gender		**	**	**
Female	185 (62)	241 (56)	1109 (75)	1264 (78)
Male	153 (63)	263 (67)	772 (76)	909 (77)
Age	**	**	**	**
≤ 14 years old	17 (77)	28 (72)	248 (89)	252 (88)
15 years old	62 (70)	71 (58)	598 (89)	685 (87)
16 years old	94 (65)	144 (62)	534 (76)	616 (80)
17 years old	97 (65)	162 (62)	348 (65)	429 (69)
≥ 18 years old	67 (50)	102 (58)	160 (53)	196 (58)
Formal Sexual Education			**	**
Received	277 (87)	641 (88)	1683 (90)	1933 (90)
Not received	42 (55)	83 (62)	192 (69)	219 (72)

¹ Percentages responding ‘yes’ are shown in parentheses

** p < .05

The results of the bivariate analyses regarding alcohol and drug use during last intercourse are shown in Table 3. Responses to the question of whether the respondent used drugs or alcohol at the time of their last sexual contact are shown in Table 3. There was a consistent significant association between the use of drugs or alcohol during sex and race/ethnicity. Black youth were significantly less likely to report the use of drugs or alcohol. This relationship was evident across both survey years and for both Alabama and Florida. Another consistent pattern was shown for gender. Males were more likely to report alcohol or drug use at last sex than

females. This was true for Florida for both survey years. The relationship was not statistically significant for Alabama for the 2003 survey. Age was significantly associated with the use of alcohol or drugs for all survey years and both states. A statistically significant association was found between the use of alcohol and drugs and receiving formal sexual education. For Alabama the association was statistically significant for the 2007 survey. In Florida the association was statistically significant for both the 2003 survey year and the 2007 survey year. However, this relationship was statistically significant in Alabama only for the 2007 survey year.

Table 3: Bivariate Associations by State, Year, Reported Sexual Activity and Demographic Variables and Drug or Alcohol Use at Last Sex¹

Characteristic	Alabama		Florida	
	2003	2007	2003	2007
Race				
Black	17 (13)	37 (12)	54 (13)	43 (6)
White	80 (22)	93 (22)	211 (23)	202 (33)
Gender				
Female	51 (17)	61 (14)	155 (16)	164 (17)
Male	57 (33)	89 (22)	211 (23)	239 (22)
Age				
≤ 14 years old	7 (32)	6 (16)	20 (23)	26 (25)
15 years old	18 (21)	22 (17)	60 (16)	72 (19)
16 years old	30 (11)	38 (16)	115 (21)	100 (18)
17 years old	19 (13)	46 (17)	99 (18)	123 (19)
≥ 18 years old	34 (25)	39 (22)	84 (22)	87 (22)
Formal Sexual Education				
Received	85 (19)	189 (18)	299 (4)	322 (18)
Not received	18 (23)	38 (27)	75 (17)	75 (35)

¹ Percentages responding ‘yes’ are shown in parentheses
 ** p < .05

Table 4: Adjusted Odds of Using a Condom at Last Intercourse

Alabama		OR	Florida		OR
Year	2003	1.00	Year	2003	1.00
	2007	0.85		2007	1.09
Race	Black	1.00	Race	Black	1.00
	White	0.43		White	1.76**
Gender	Male	1.00	Gender	Male	1.00
	Female	0.86		Female	1.59**
Age		0.66**	Age		0.67**
Sex Ed.	Not Received	1.00	Sex Ed.	Not Received	1.00
	Received	1.1		Received	1.2

** p < .05

Multivariate Analyses

A multivariate analysis of condom use controlling for year of survey, race, gender, age and receipt of sex education is provided in Table 4. In Alabama the 2007 survey cohort, whites, and females were less likely to report condom use. These odds however, were not statistically significant. The declining use with age (OR=0.66) was statistically

significant. Receiving sex education did not change the odds of using a condom at last sexual encounter.

In Table 5, the multivariate logistic regression analysis of alcohol and/or drug use during last intercourse depicts that in both states, for every year that a high school student’s age increases the odds of drinking and/or using drugs increases by 63% in Alabama and 58% in Florida.

Table 5: Adjusted Odds of Using Drugs or Alcohol at Last Intercourse

Alabama		OR	Florida		OR
Year	2003	1.00	Year	2003	1.00
	2007	0.93		2007	0.91
Race	Black	1.00	Race	Black	1.00
	White	0.96		White	1.39**
Gender	Male	1.00	Gender	Male	1.00
	Female	0.69**		Female	0.60**
Age		1.63**	Age		1.58**
Sex Ed.	Not Received	1.00	Sex Ed.	Not Received	1.00
	Received	0.69		Received	0.48**

** p < .05

Discussion

This study found significant bivariate associations for demographic variables of race, gender, age and condom use during the last sexual intercourse. The findings from this research regarding the associations between race and age with sexual risk factors for adolescents are supported by numerous previous studies. A recent report concluded that, "Sex education was found to be particularly important for subgroups that are traditionally at high risk for early initiation of sex and of contracting sexually transmitted diseases (Mueller, et al, 2008)." These researchers also noted that exposure to formal sexual education of any kind is significantly associated with female students ever having sexual intercourse (Mueller, et al, 2008). The present study found similar associations. Whereas Alabama adolescents exposed to comprehensive sexual education displayed slightly lower odds of using condoms during last sexual intercourse, this was not a statistically significant association.

This study also found that alcohol and drug use was more likely to be reported among surveyed Florida than Alabama high school students, although in both states white teens were more likely to report such behavior than blacks. This finding mirrors the national results from the YRBSS. The findings here are also similar to the national YRBSS regarding gender and reported alcohol and/or drug use.

The known sex education content differences would support the expectation that Alabama, where students receive comprehensive sexual health education, would have higher reported condom use. Yet, although condom use was higher among youth receiving comprehensive sexual education (Alabama), the criterion for statistical significance was not met. Nonetheless, the reverse age trend of

condom use during last intercourse presents a health policy and education opportunity. These trends in decrease of protective behaviors support the need for ongoing instead of episodic sexual health education exposure of either kind. Finally, there was not a substantial significant difference between Alabama and Florida to draw a conclusion about the policy influences regarding the type of sexual education received.

The present study has notable limitations. This study relied on the Youth Risk Behavior Surveillance System of Alabama and Florida that includes self-report measures. Students may have provided responses to survey questions that are deemed acceptable by society. Recall bias is a major factor due to the number of questions of the YRBS survey tool (over 100 questions). In addition, the counties of Broward, Hillsborough, Miami-Dade, Orange, and Palm Beach, whose data represent a large proportion of Florida's STI and HIV/AIDS infections, were not included. These counties do not receive sexual education funding from State government, and each provides students with a comprehensive sexual education curriculum as determined by the local school board in those districts. Sexual education may differ by quality, quantity, and content provided to students and it may vary depending on the county within each state.

Public Health Implications

Previous research, such as the Mathematica study commissioned by the US Department of Health and Human Services, establishes the benefit of a more inclusive approach to reducing sexual health risk factors among U.S. adolescents (Trentholm, et al, 2007). Presently, the federal government limits funding to abstinence-only sexual education, even though there has not been strong evidence-based data to conclude that abstinence-only sexual education

increases the age of sexual initiation and reduces sexual risk behaviors among adolescents.

There is little difference between Alabama's and Florida's youth in terms of risk behaviors. In the future, research efforts inclusive of both educational approaches will be necessary to determine the strengths and weaknesses of different curricula. It is also recommended that the federal government provide funding to all states regardless of sexual education policy type until there are evidence-based findings to conclude that abstinence-only comprehensive sexual education is an effective and efficient prevention tool to assist in the progression of the STD and HIV/AIDS epidemic among all populations. The definitive evidence of which sexual education approach has greater efficacy can only come from randomized community trials in which non-sexually active youth are enrolled and followed over time. In this way, multiple covariates can be addressed and risky behavior quantified.

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