Continuing Education

Selected Risk and Protective Factors Associated With Two or More Lifetime Sexual Intercourse Partners and Non-Condom Use During Last Coitus Among U.S. Rural High School Students

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ABSTRACT

This analysis determined the association between 13 selected health risk and protective factors and reporting two or more lifetime sexual intercourse partners and non-condom use for last coitus among sexually experienced U.S. rural high school students. The sample was 569 sexually experienced adolescent females and 561 sexually experienced adolescent males who participated in the national 1999 Youth Risk Behavior Survey and who attended rural high schools. For females, coital debut before age 15, forced sexual intercourse, physical abuse, and marijuana use were associated with having two or more lifetime sexual intercourse partners. Coital debut before 15, binge drinking, and marijuana use were associated with having two or more sexual intercourse partners for males. Coital debut before age 15, forced sexual intercourse, and regular cigarette smoking were associated with non-condom use at last coital episode for females. Forced sexual intercourse and cocaine use were associated with non-condom use at last coital episode for males. A greater number of correlates were identified for females as opposed to males. The findings suggest that rural adolescents who initiate sexual activity at an early age are at markedly greater risk of engaging in subsequent sexual risk behaviors, such as having multiple sex partners and non-condom use. Further, substance use and a history of forced sex were also prominent determinants of sexual risk-taking. The findings portend that there is value in delaying the onset of coitus until adolescents are older. Thus, risk reduction programs should encourage the postponement of sexual initiation. Finally, the findings suggest that programs that address the key role of substance use and the psychological sequelae of sexual abuse might be more effective at reducing sexual risk-taking among rural adolescents.

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About 15.3 million new sexually transmitted disease (STD) cases occur each year in the United States, with one-quarter of new cases occurring in teenagers (American Social Health Association, 1998). The Institute of Medicine (Eng & Butler, 1997) states that 3 million teenagers in the United States get STDs each year and that one in four new HIV infections are estimated to occur in persons between ages 13 and 20. Having multiple partners and failing to use condoms among adolescents are two important behavioral risk factors for acquiring an STD. Greater frequency of changing sex partners has been associated with increased STD incidence (Anderson, Wilson, Doll, Jones & Baker, 1999; Wasserheit & Aral, 1996). Further, laboratory, clinical, and field studies have shown that condoms reduce the risk of STDs if they are used correctly for each sexual exposure (Stone, Timyan, & Thomas, 1999).

Because the majority of teenage relationships are short in duration, sexually active adolescents often have multiple sequential partners (Santelli, Brener, Lowry, Bhatt, & Zabin, 1998). The 1999 Youth Risk Behavior Survey (YRBS) (Centers for Disease Control and Prevention [CDC], 2000) reported that about 13% of high school females and 19% of high school males in the United States reported four or more sex partners during their lifetimes. The YRBS also found that about 51 and 66% of the same females and males, respectively, used a condom during last sexual intercourse. These data indicate that many sexually active adolescents are at risk for HIV/STD.

Previous research indicates that adolescent health-related behaviors are correlated, and that sexual risk behaviors may be associated with other behaviors that negatively affect decision making and well-being (Jessor, Donovan, & Costa, 1991). Further, Small and Luster (1994) suggest that there is a clear linear relationship between several risk behaviors and adolescent sexual behavior. Recent studies, as discussed below, suggest relationships exist between sexual risk taking and three distinct behavioral areas: sexual experiences, sexual and physical abuse, and alcohol and drug abuse.

One of the strongest predictors of non-condom use and having multiple sexual intercourse partners is early coital debut. In one study, based on data from the 1992 YRBS and the 1992 National Health Interview Survey, Santelli et al. (1998) reported that females who engaged in sexual intercourse before age 14 were almost 7 times more likely to have had six or more lifetime partners. Males were more than 12 times more likely to have had six or more lifetime partners if they had engaged in sexual intercourse before 14. A negative relationship between number of sexual partners and condom use has also been established, with condom use declining as number of partners increases (Richter, Valois, McKeown, & Vincent, 1993).

Studies have also shown a relationship between sexual and physical abuse and risky sexual behaviors in adolescence. This relationship has been shown to be particularly prominent for females, as those who have been abused are more likely to have initiated coitus at an early age and are more likely to report having had three or more lifetime sexual intercourse partners (Raj, Silverman, & Amaro, 2000; Schreck, 2001). Sexually abused males are also more likely to engage in sexually risky behaviors. Studies suggest that males who have experienced forced sexual intercourse are more likely than those without such a history to have had multiple sexual partners or sex resulting in pregnancy (Raj et al., 2000). Moreover, research indicates that there is a significant relationship between experiencing dating violence and date rape, and having many sexual partners (Valois, Oeltmann, Waller, & Hussey, 1999). Some authors have proposed that sexual abuse influences personality variables (e.g., self esteem, perceived interpersonal control, perceived value of health), negating healthy sexual decision-making (Santelli et al., 1998; O'Keefe & Treister, 1998). A similar relationship may exist between physical abuse and sexual behavior. For example, adolescent females who had physically abusive parents were more likely to be sexually experienced than those who did not (Small & Luster, 1994).

Finally, a relationship between alcohol and drug use and risky sexual behavior in adolescents has been established. Santelli and colleagues (2001) found that among young men and women, recent substance use and use of alcohol or drugs at last intercourse were both strongly associated with having had more than one sexual partner in the past 3 months, but no relationship was found for condom use at last coitus. Prior use of alcohol and drugs greatly increases the risk of early initiation of sexual intercourse, having multiple partners, and failure to use condoms (DiClemente et al., 1992). For White females, alcohol, cigarette, and marijuana use have been associated with having many sexual partners (Valois et al., 1999). Adolescent males with a history of alcohol and drug use are more likely to engage in sexual intercourse at a young age (Staton et al., 1999). Further, increased substance abuse has been associated with decreased intentions to use condoms among females (Christ, Raszka, & Dillon, 1998).

As previously described, many studies have attempted to discern the relationships between various risky health behaviors and sexual risk taking. However, few to date have attempted to determine what protective factors might be associated with sexual risk behaviors. Comprehensive sexuality education may be one such factor, leading to delayed intercourse and increased condom use (Haignere, Gold, & McDanel, 1999). For example, a study based on the 1988 National Survey of Adolescent Males found that sexuality education (including information regarding HIV and AIDS) was associated with modest decreases in number of sexual partners and frequency of intercourse (Ku, Sonenstein, & Pleck, 1992). Further, it has been suggested that effective patient education during visits to sexual health clinics can increase consistent condom use (Christ et al., 1998).

Table 1. Selected Demographic Traits of the Female (*N*=569) and Male (*N*=561) Samples

Characteristic	Female (%)	Male (%)
Age (Years)		
14	7.0	5.0
15	17.4	17.1
16	27.6	24.2
17	26.9	30.1
18 or older	21.1	23.5
Grade		
9th	18.5	20.5
10th	25.7	27.0
11th	24.1	22.1
12th	31.8	30.2
Ethnicity		
White–not Hispanic	45.4	45.2
Black–not Hispanic	46.8	45.9
Hispanic or Latino	1.1	2.1
Asian or Pacific Islander	2.6	2.5
American Indian or Alaskan Native	.7	.2
Other	3.3	4.1

Empidemiological surveillance reports indicate that HIV/STDs are serious health problems in rural areas in the United States (CDC, 1999; Rural Center for AIDS/STD Prevention, 1996). Crosby, Yarber, and Kanu (1998), in their study at one rural high school and in an analysis of YRBS data, found that many rural youth engage in risky sexual behavior and at least as much as urban youth. Further, they found that rural males were more likely to practice risky sexual behaviors relative to a national sample. Despite these findings, most studies to date focus on urban youth. Those that include rural adolescents often do not report separate analyses for rural adolescents nor do they conduct comparative analyses of rural and urban samples.

Given that many rural adolescents are engaging in risky sexual behaviors, studies are needed to examine the potential risk factors associated with risky sexual behavior among rural adolescents. Having multiple lifetime sexual partners and failing to use a condom at last intercourse were selected as critical risk activities as they have been established in the literature as possible precursors to acquiring an STD (Anderson et al., 1999; Stone et al., 1999). Accordingly, this analysis determined the association between selected risk and protective factors and two or more lifetime sexual intercourse partners and non-condom use for last coitus among U.S. adolescents from rural high schools.

METHODS

Data Collection

Data from the 1999 YRBS were utilized for this analysis. The YRBS biennially measures the prevalence of six categories of priority health-risk behaviors among youth through representative national, state, and local surveys. The 1999 national YRBS employed a three-stage cluster sample design to obtain a representative sample of 15,349 students in grades 9–12 from 41 U.S. states. Students in randomly selected classrooms completed a self-administered, 88-item questionnaire, yielding a participation rate of 86%. All data were weighted to adjust for nonresponse and varying probabilities of selection. A more detailed description of the 1999 YRBS, including sampling and weighting procedures, is available elsewhere (CDC, 2000).

Study Sample

Selected demographic traits are given in Table 1. The sample included 1,130 sexually experienced students (569 females and 561 males) who attended rural high schools throughout the country. Rural designations were done by CDC and based on size of county where the school was located. The mean ages for the females and males were 15.4 and 15.5 years, respectively. As shown in the table, all four high school grades were represented, with slightly higher proportions found in the 10th and 12th grades. The sample was predominantly comprised of White and Black students (90%), with the remaining 10% self-identifying as Hispanic or Latino, Asian or Pacific Islander, or American Indian or Alaskan Native.

Determinants

Based on the literature, 11 behavioral risk factors representing diverse domains were selected. These domains included sexual behaviors, sexual and physical abuse, alcohol and drug use, and age of coital debut (Tables 2 and 3). Two protective factors were also included as potential determinants of sexual risk behavior: adolescents' exposure to HIV/AIDS education in school and whether adolescents discussed HIV/AIDS with health service providers.

Outcomes

This analysis focused on two important outcomes: non-condom use at last coitus and having two or more lifetime sex partners (defined as multiple lifetime sexual partners).

Data Analysis

Because previous literature has shown distinctly different profiles of rural male and female adolescent sexual risk behavior (Yarber, 1996; Yarber & Crosby, 1997), all analyses were conducted separately by gender. Chi-squares were conducted to determine significant

Table 2. Percentage of Behaviors and Associations Between Having Two or More Lifetime Sexual Intercourse Partners Versus One Lifetime Partner and Selected Risk and Protective Factors for Sexually Experienced Females (*N* = 569) Attending U.S. Rural High Schools

Risk and Protective Factors	2+ Partners *N*=372 (%)	1 Partner *N*=197 (%)	Adjusted OR[a]	Logistic Regression 95% CI[b]	*p*
Coital debut before age 15*	59.1	30.4	5.47	3.30–9.04	.00
Experienced forced sexual intercourse*	25.6	11.3	2.42	1.37–4.27	.00
Physically abused by partner past 12 months*	17.2	6.6	2.21	1.06–4.59	.03
Used alcohol before last coitus*	16.9	9.2			
Drank alcohol past 30 days	58.4	58.0			
Binge drank past 30 days*	35.1	26.0			
Regular cigarette smoking*	31.4	22.6			
Used marijuana past 30 days*	28.1	12.3	3.24	1.83–5.76	.00
Used cocaine past 30 days*	5.4	1.0			
Used inhalants past 30 days*	5.7	1.5			
Taught about HIV/AIDS in school	89.8	88.3			
Discussed HIV/AIDS with health service provider*	57.7	40.8	.617	.41–.94	.02

*Significant bivariate relationships at the $p<.05$ level.
[a]Adjusted odds ratios (OR) calculated using race/ethnicity, age, and grade as covariates.
[b]Confidence intervals (CI) excluding 1.00 are significant at $p<.05$.

Table 3. Percentage of Behaviors and Associations Between Having Two or More Lifetime Sexual Intercourse Partners Versus One Lifetime Partner and Selected Risk and Protective Factors for Sexually Experienced Males (N = 554) Attending U.S. Rural High Schools

Risk and Protective Factors	2+ Partners *N*=401 (%)	1 Partner *N*=153 (%)	Adjusted OR[a]	Logistic Regression 95% CI[b]	*p*
Coital debut before age 15*	74.8	27.0	11.05	6.1–19.98	.00
Experienced forced sexual intercourse*	8.8	3.4			
Physically abused by partner past 12 months*	14.2	5.3			
Used alcohol before last coitus*	29.8	14.5			
Drank alcohol past 30 days*	72.5	61.6			
Binge drank past 30 days*	50.1	39.3	2.58	1.4–4.54	.00
Regular cigarette smoking	35.2	31.6			
Used marijuana past 30 days*	45.7	25.8	2.04	1.18–3.53	.01
Used cocaine past 30 days	5.8	3.3			
Used inhalants past 30 days	5.8	4.6			
Taught about HIV/AIDS in school	88.4	90.2			
Discussed HIV/AIDS with health service provider	25.3	17.4			

*Significant bivariate relationships at the $p<.05$ level.
[a]Adjusted odds ratios (OR) calculated using race/ethnicity, age, and grade as covariates.
[b]Confidence intervals (CI) excluding 1.00 are significant at $p<.05$.

Table 4. Percentage of Behaviors and Associations Between Non-Condom Use for Last Sexual Intercourse Versus Condom Use and Selected Risk and Protective Factors for Sexually Experienced Females (N = 560) Attending U.S. Rural High Schools

Risk and Protective Factors	Non-Condom Use *N*=320 (%)	Condom Use *N*=240 (%)	OR[a]	Logistic Regression 95% CI[b]	*p*
Coital debut before age 15*	55.4	44.3	1.86	1.26–2.75	.00
Had two or more lifetime sexual partners*	73.8	59.2			
Experienced forced sexual intercourse*	26.2	16.4	1.85	1.19–2.85	.01
Physically abused by partner past 12 months	15.2	12.3			
Used alcohol before last coitus	15.0	13.1			
Drank alcohol past 30 days	57.6	54.2			
Binge drank past 30 days	32.9	31.8			
Regular cigarette smoking*	36.0	22.6	1.80	1.16–2.80	.01
Used marijuana past 30 days	25.3	21.2			
Used cocaine past 30 days	5.4	2.8			
Used inhalants past 30 days	4.2	4.7			
Taught about HIV/AIDS in school	86.6	90.9			
Discussed HIV/AIDS with health service provider	58.0	47.6			

*Significant bivariate relationships at the $p<.05$ level.
[a]Adjusted odds ratios (OR) calculated using race/ethnicity, age, and grade as covariates.
[b]Confidence intervals (CI) excluding 1.00 are significant at $p<.05$.

bivariate relationships. Adjusted odds ratios were calculated with race/ethnicity, age, and grade as covariates. When necessary, dependent variables were dichotomized using median splits for the odds ratio calculations. Acceptance of significance was based on an alpha level of .05 or less.

RESULTS

Tables 2 through 5 present the percentage of the sample who reported the behaviors and the results of the odds ratio tests. About 65 and 72% of the females and males, respectively, had two or more lifetime sexual intercourse partners. About 42 and 35% of the females and males, respectively, indicated that they did not use a condom during their last sexual intercourse episode.

As presented in Table 2, significant bivariate associations between two or more lifetime sexual intercourse partners and risk variables for females were established for 9 of the 10 risk behaviors. Results of the first set of logistic regression analyses revealed that coital debut before age 15, forced sexual intercourse, physical abuse, and marijuana use over the past 30 days were associated with having two or more lifetime sexual partners. Females who engaged in sexual intercourse before age 15 were more than five times as likely to have had multiple partners. Those females who reported physical or sexual abuse were more than twice as likely to have multiple partners. Those who had used marijuana were more than three times as likely to report having multiple partners. Discussing HIV/AIDS with a health service provider was significantly related to having two or more lifetime sexual partners; these students were 62% more likely to have had multiple partners.

Table 3 indicates seven significant bivariate relationships between having two or more lifetime sexual intercourse partners and the 10 risk variables for males. The results of the logistic regression analyses indicated that coital debut before age 15, and binge drinking and marijuana use over the past 30 days were related to having multiple lifetime intercourse partners. Engaging in sexual intercourse before age 15 was strongly associated with having two or more sexual partners; males who had intercourse before age 15 were 11 times more likely than males who delayed their coital debut to have multiple partners. Males who reported binge drinking and using marijuana in the past 30 days were more than twice as likely to have had multiple partners. No significant differences were found for the protective educational factors.

As presented in Table 4, significant bivariate relationships between not using a condom and the risk variables were established for four of the behavioral risk factors. Three of these resulted in significant odds ratios. Females who had their coital debut before age 15, who had experienced forced sexual intercourse, and who

Table 5. Percentage of Behaviors and Associations Between Non-Condom Use for Last Sexual Intercourse Versus Condom Use and Selected Risk Factors for Sexually Experienced Males (*N* = 549) Attending U.S. Rural High Schools

Risk and Protective Factors	Non-Condom Use *N*=353 (%)	Condom Use *N*=196 (%)	OR[a]	Logistic Regression 95% CI[b]	*p*
Coital debut before age 15*	67.9	58.5			
Had two or more lifetime sexual partners	73.8	71.2			
Experienced forced sexual intercourse*	11.3	5.2	2.17	1.10–4.29	.03
Physically abused by partner past 12 months	11.9	12.4			
Used alcohol before last coitus	28.9	24.2			
Drank alcohol past 30 days	67.6	71.3			
Binge drank past 30 days	49.5	46.4			
Regular cigarette smoking	35.4	32.9			
Used marijuana past 30 days	45.8	37.6			
Used cocaine past 30 days*	9.8	2.6	4.82	1.98–11.73	.00
Used inhalants past 30 days	6.7	4.8			
Taught about HIV/AIDS in school	85.5	90.9			
Discussed HIV/AIDS with health service provider	24.5	22.5			

*Significant bivariate relationships at the $p<.05$ level.
[a]Adjusted odds ratios (OR) calculated using race/ethnicity, age, and grade as covariates.
[b]Confidence intervals (CI) excluding 1.00 are significant at $p<.05$.

were regular cigarette smokers were almost twice as likely to report not using a condom during their last intercourse experience. There were no significant differences found regarding the protective educational factors.

Table 5 indicates there were three significant bivariate associations between not using a condom at last coitus and the risk behaviors. Results of the logistic regression analysis revealed that forced sexual intercourse and cocaine use were related to non-condom use. Cocaine use was most strongly related, with those who reported using cocaine during the previous 30 days almost five times more likely to not use a condom. Those who experienced forced sexual intercourse were twice as likely to report non-condom use.

DISCUSSION

This analysis indicates there are important relationships between prior sexual behavior, sexual and physical abuse, and alcohol and drug use, and two selected risky sexual behaviors among this national sample of sexually experienced rural high school students. Although similar associations have been identified among populations of adults and urban adolescents, this is the first study identifying these associations among a nationally representative sample of rural adolescents.

Particularly noteworthy is the relationship between early coital debut (before age 15) and both of the assessed risky sexual behaviors for both females and males. Females and males reporting coital debut before age 15 were much more likely to report having multiple sexual partners than their counterparts who did not have intercourse before age 15. Females with coital debut prior age 15 were also less likely to use a condom for last intercourse than those having intercourse after age 15. Clearly, early coital debut among adolescents is problematic. Engaging in intercourse at a younger age widens the possible time frame for exposure to STDs and pregnancy. Many adolescents practice serial monogamy, engaging in sexual relations with one partner at a time but in relationships relatively short in duration. This, in conjunction with an early coital debut, provides an opportunity for an increased number of coital partners, thus increasing possible exposure to STD. Further, the epithelial layer of the uterus is less developed in early adolescence, making adolescent females more susceptible to infection (Critchlow et al., 1995).

Consistent with previous research (Mahler, 1996; Nagy, DiClemente, & Adcock, 1995), a strong relationship between a history of forced sexual intercourse and non-condom use was found in this sample. Although more female students reported a history of forced sex than the male students, both female and male students having experienced forced intercourse were less likely to use a condom at last coitus than those not experiencing forced coitus. Females with a history of forced intercourse, as well as physical

abuse, were also more likely to have had two or more lifetime coital partners than their counterparts without such a history. Studies have suggested that females with a history of forced sex have less perceived control over their sexual behavior, lower interpersonal control, and lower self-esteem (Mahler, 1996; O'Keeke & Treister, 1998). Although sexual abuse may be more prevalent among females, Raj et al. (2000) stated its impact may be more significant for young males. This may help explain why forced sex was related to both having two or more lifetime coital partners and non-condom use in the males of this sample.

The lack of a relationship found in the current investigation between alcohol and drug use and sexual behavior is strikingly incompatible with previous research. Santelli and colleagues (1998, 2001) found alcohol and substance abuse to be some of the most important risk factors for multiple partners in the recent past. In Valois et al. (1999) alcohol was the only risk behavior that was significantly and consistently related to an increase in number of partners for both genders of all ages. In our study, binge drinking was related to having multiple partners, but only for males. Alcohol use and alcohol use at last coitus were not associated with risky behaviors for either gender. It may be that, particularly in rural communities, drinking alcohol has become a normative behavior for many adolescents. Interestingly, there were significant relationships between marijuana and cocaine use and having multiple partners and non-condom use, particularly for males. However, Santelli and colleagues (2001) did not find a relationship between substance use and condom use at last coitus once they controlled for the number of substances used among young adults. The number of substances abused may be an important variable to consider in future research.

The protective value of exposure to HIV/AIDS education in school and discussing HIV/AIDS with a health service provider and risky sexual behavior was also not substantiated in this investigation. Discussing HIV/AIDS was related to having multiple partners for females, but not in the expected direction. More specifically, females who had two or more lifetime partners were more likely to have talked with a health professional about HIV or AIDS. This may indicate, however, a concern on the part of the more sexually active females regarding STDs, leading to seeking further information from a health service provider. The lack of relationship between school HIV/AIDS education and risky sexual behavior may be explained by the fact that the majority of rural youth (approximately 90%) did receive HIV/AIDS education, thus creating a ceiling effect. Further, the YRBS questionnaire did not assess the quality or length of HIV/AIDS instruction, both of which impact instructional effectiveness.

One notable gender difference was that, as a group, there were more significant relationships between the behavioral risk factors and risky sexual activity for the female students than for the male students. Similar findings were reported by Small and Luster (1994), in that 12 of the 14 variables included in their analysis predicted sexual activity for females, whereas only 8 were found to be significant for males. Further research should investigate possible differences between males and females regarding antecedents of their sexual risk behavior. Potential reasons why fewer antecedents are found for males should be explored with samples of rural youth.

This analysis was limited given its reliance on self-reported data of sexual behavior. However, compared with other large-scale studies of sexual behavior (National Survey of Family Growth, National Survey of Adolescent Males, National Longitudinal Study of Adolescent Health) the YRBS incorporates administration methods (for example, confidential participation in the school as opposed to the home) that may encourage truthful responding (Santelli, Lindberg, Abma, McNeely, & Resnick, 2000). Further, analysis based on previously collected data is limited by the questions included in original questionnaire. For example, the YRBS lacks information about peer norms and personality traits that may influence behavior. The YRBS does not assess the sexual orientation of the respondents; therefore, we cannot assume that all of the participants were heterosexual. Additionally, items referring to parent's level of education and having a sex partner 2 years older than the respondent were removed from the 1999 version. These factors have been significantly related to risky sexual behavior in the past but are no longer addressed in the YRBS. Also, the YRBS is a cross-sectional survey and causal relationships between the risk factors cannot be inferred.

These results have important implications for planning risk prevention education for rural adolescents, in that reducing the number of associated risk factors may also prevent some of the detrimental sexual outcomes. For example, coital debut prior to age 15, in our analysis and in other studies, had a strong relationship with having two or more lifetime coital partners and non-condom use. This finding suggests that rural adolescents' sexual risk behavior may be effectively addressed by programs that specifically seek to delay adolescent coital initiation. Rural youth who use tobacco, marijuana, and cocaine may be particularly likely to engage in sexual risk behaviors; thus, they may also be a priority population for prevention efforts. Thus, comprehensive school health education, focusing on a wide variety of health behaviors, may be an effective strategy for reducing rural adolescents' sexual risk behavior. Given that more significant associations between risk factors and risky sexual behaviors were found for the female students than male students, rural females should particularly be targeted for prevention education. Lastly, the findings suggest that the psychosocial sequelae of sexual and physical abuse include subsequent sexual risk behaviors of rural youth. Hence,

counseling programs could be implemented to assist these youth in managing forms of abuse.

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