Research Article

Exploring Gender Differences in the Relationship between HIV/STD Testing and Condom Use among Undergraduate College Students

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ABSTRACT

Background: *Rates of HIV/AIDS, and other sexually transmitted diseases (STDs), are increasing among university students.* ***Purpose:*** *The purpose of this study was to examine gender differences in the relationship between condom use and (1) HIV/STD testing behaviors, (2) STD treatment behaviors and, (3) alcohol use behaviors.* ***Methods:*** *A survey was administered to 1,500 undergraduate students in a university system in the Northeast. Frequency tests and the Fisher Exact test for associations were conducted.* ***Results:*** *Analysis was conducted on 1,410 surveys. Rates of sexual behavior were high, while condom use was reportedly low. Females reported higher rates of sexual activity and lower rates of condom use. Females who had been tested for HIV and STDs reported significantly lower rates of condom use than those not tested. Even more significant, females who had been treated for an STD reported low rates of condom use.* ***Discussion:*** *College students are reportedly continuing to practice unsafe sexual behaviors despite health education efforts on college campuses, especially females. Future research should explore the causal relationship between HIV/STD testing and treatment behaviors and condom use.* ***Translation to Health Education Practice:*** *This study suggests new ways of conceptualizing health education programming on college campuses through multilevel programming targeting behavioral concepts, such as perceived risk.*

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BACKGROUND

Presently, Acquired Immune Deficiency Syndrome (AIDS) is a disease with no cure or vaccine, and its medical treatment is life long. The Centers for Disease Control and Prevention (CDC) surveillance data revised on June 28, 2007, show that from the beginning of the epidemic through 2006 the cumulative number of AIDS cases among young adults (20-24 years of age) is estimated to be 36,224 or 3.6% of total reported cases.[1] In Connecticut, the 20-29 age group comprises 12.8% of cumulative AIDS cases through 2007 and 25% of cumulative reported HIV cases since January 1, 2002, when HIV became a reportable disease in Connecticut.[2]

Among the 33 states with confidential name-based HIV infection reporting, gender ratio has been shown to vary by age at diagnosis. In 2006, females accounted for 36% of adolescents aged 13 to 19 years who were diagnosed with HIV infection, compared with 28% of young adults aged

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20 to 24 years and 25% of persons aged 25 and older.[1] From 2001 through 2005, the majority of AIDS cases diagnosed among adolescent and young adult females were attributed to high-risk heterosexual contact (heterosexual contact with a partner who is at increased risk for HIV infection, i.e., a homosexual or bisexual man, an injection drug user, or a person with documented HIV infection), and in the same time period the majority of cases among adolescent and young adult males were attributed to male-to-male sexual contact.[2]

Students attending universities engage in behaviors that put them at risk for the human immunodeficiency virus (HIV) and other sexually transmitted diseases (STDs). The 2006 National College Health Assessment[3] reported sexual experience among college students at 68.5% for oral sex, 64.2% for vaginal sex, and 22.3% for anal sex. Additionally, 23.6% of students reported having two or more sexual partners within the past 12 months. Specific rates of reported condom use and other safer sex behaviors vary across samples of college students. Data collected by the American College Health Association (ACHA) indicate that among sexually active students, only 3.9% reported using a condom the last time they had oral sex, 54% the last time they had vaginal sex, and 26.6% the last time they had anal sex.[3] Whereas the majority of students surveyed on college campuses report having used condoms some time in the past, routine and regular use of condoms is low.

Many studies have investigated factors associated with condom use among college students and some have demonstrated that higher sexual risk behavior correlates with alcohol use.[4-6] Data examining correlations between alcohol use and condom use, however, have been inconsistent.[7-10] Leigh assessed the relationship between alcohol use and condom use by analyzing 13 studies that met a defined criterion.[11] The results of this meta-analysis showed that "alcohol use was related to nonuse of condoms at first intercourse, with a trend among adolescents in general toward nonuse of condoms when drinking."[11] A more comprehensive understanding of this relationship is needed, especially as it relates to gender.

HIV rates among college students are approximated to be 1/500 and STD rates among young adults (20-24 years of age) are among the highest overall, including rates of chlamydia, gonorrhea, and herpes.[12,13] Public health experts agree that in addition to prevention, early detection of HIV and other STDs is one way to prevent future cases.[12] HIV testing rates remain low in the United States, and the CDC estimates that 25% of Americans who are HIV+ do not know their status and account for almost 50% of new HIV cases.[14] As a way to increase HIV testing and reduce new infections, the CDC released revised HIV screening recommendations for health care settings in 2006 to include all adolescent and adult patients (13-64 years of age) attending any type of primary care facility.[15] The new recommendations are an "opt out" process requiring that primary care health providers counsel their patients on HIV screening and test them unless patients decline in writing.[15] Additionally, the CDC recommends annual screening for chlamydia for women ≤25 years of age be conducted as part of a routine annual exam as a way to prevent pelvic inflammatory disease that could lead to infertility.[16]

College campuses have become one locale where students can get anonymous or confidential HIV testing, along with pre- and post-test counseling, as well as STD tests and physical exams.[17,18] Despite the enormous publicity about HIV and its risk factors, the benefits of finding out one's status, and the efficacy of anti-retroviral medications, HIV testing rates on college campuses remain low. Rates of HIV testing among college students range from 15% to 25% depending on the study.[18-20] Studies, however, consistently find that females and those with more than one sexual partner are more likely to get tested for HIV. Additionally, it is not clear whether there are any positive correlations between HIV/STD testing and protective behaviors such as condom use. These topics merit further exploration.

For more than four decades, the Health Belief Model (HBM) has been one of the most influential and widely used psychosocial approaches to explaining health related behavior.[21] The HBM has three key components: (1) perceived risk and seriousness of a particular illness, (2) perceived benefits of a certain action to prevent the illness and the barriers to taking that action, and (3) self-efficacy about carrying out a recommended preventative behavior. Many studies have successfully used the Health Belief Model as the theoretical basis for determining condom use and HIV/STD testing behaviors among adolescents and college students.[22-28] These studies show that perceived risk and seriousness of HIV/STDs and one's self-efficacy to use condoms both point to future use of condoms. For example, HIV screening sessions and knowing someone infected with HIV/AIDS have been shown to be influential in increasing levels of concern about infection.[24,25] The survey questions related to sexual behavior and condom use in this study were guided in their development by the Health Belief Model, but were not intended to test the model.

Sexually transmitted diseases continue to have a disproportionate impact on young adults of college age. Abstinence and behavioral changes, specifically condom use and HIV/STD testing, are accepted as the best methods available to decrease the number of new infections in this population. The ongoing trends of high rates of sexual activity, low rates of consistent condom use, and low rates of HIV/STD testing among college students present unique challenges to public health practitioners. Efforts are required to gain a more comprehensive understanding of the gender specific factors associated with condom use and HIV/STD testing and the relationship between these variables in this population.

PURPOSE

The purpose of this study was to examine gender differences in the relationship between condom use and (1) HIV/STD testing behaviors, (2) STD treatment behaviors, and (3) alcohol use behaviors. The following research questions were addressed in this study:

• Is there a difference in rates of condom use among college undergraduate students based on gender?

• Is there a difference in rates of STD testing, HIV testing, or STD treatment among college undergraduate students based on gender?

• Among sexually active college students, is there an association between STD testing, HIV testing, or STD treatment and condom use and does this association differ based on gender?

• Among sexually active college students, is there an association between alcohol use or binge drinking and condom use and does this association differ based on gender?

METHODS

There were four campuses included in the state university system where this research was conducted. Geographically, these campuses were dispersed throughout the state and located in medium sized urban or suburban centers. Undergraduate enrollment across the system totaled 27,775 full- and part-time undergraduate students during the academic year of 2004-2005 when the study took place. Each campus participating in the study determined a target sample of five percent of its undergraduate enrollment for the year. Therefore, campuses with larger enrollments had proportionally higher targeted sample sizes. Samples were obtained through stratified random sampling by first stratifying all undergraduate courses by each undergraduate level (first year, second year, etc.). Working through each campus registrar, a list of current courses was generated and organized by course level and courses were selected through simple random sampling until the desired sample size (i.e., 5% of undergraduate enrollment) was achieved. After courses were selected, faculty of these selected courses were then contacted through e-mail and asked for permission to allow their students to be invited to complete the survey during a regularly scheduled class session. E-mail correspondence included a letter from the respective university president that described the survey effort as a university-wide activity that is completed once every five years. The letter encouraged faculty to participate if their courses were randomly selected. As a result of extensive support and flexible scheduling, all of the faculty from the selected courses provided permission and scheduled a date and time for data collection.

Participation by students was voluntary and 94% of students who were enrolled in classes selected for data collection participated. The majority of non-participation was due to cancelled classes and student absences and there were no refusals recorded. Trained student research assistants administered surveys with supervision from faculty researchers. Participants were seated in a manner that allowed them privacy while completing the survey. The purpose and procedures for the survey were explained and cover letters were provided to each student indicating that completion of the survey was indicative of providing informed consent. Participants were instructed to complete the survey anonymously and place it in a collection envelope at the front of the classroom. Approval was obtained by the Institutional Review Board on each campus and system-wide prior to recruitment of participants.

Instrumentation

Data for this study were collected with the use of a subset of sexual behavior questions that were added to a larger, existing survey questionnaire distributed every four years. The larger survey is used to assess trends among a variety of health behaviors including gambling, drug use, binge drinking, dieting, and sexual aggression. The university system has historically used the results for health promotion programming purposes. The researchers for this study did not have the opportunity to alter existing questions from the larger survey which included a section of demographic questions. The subset of sexual behavior questions was developed through a review of existing sexual behavior instruments. Content validity was established through the use of an expert panel of five public health practitioners with expertise in sexual health and college student health. Test-retest reliability indicated temporal stability for this subset of sexual behavior questions (r = .83). The full survey instrument contained 83 selected response (multiple-choice) questions and students completed the survey by filling in a computer scan sheet that accompanied the survey questions. The average time required for completion of the survey was 30 minutes. Data were not available to substantiate the validity or reliability of the complete survey instrument. Specific survey questions for this study and criteria for classification are provided in Table 1.

Data Analysis

Data were analyzed using SAS version 8e.[29] Data were first recoded into dichotomous categories to allow for analysis. Four new variables were created: (1) have ever used condoms, (2) ever had sex without a condom, (3) uses condoms frequently, and (4) previous binge drinking (Table 1). One variable, frequent alcohol use, was left as an ordinal variable for this analysis. Fisher's Exact Test was used to test for associations between dichotomous variables. This test can be slightly less powerful than the typical Chi-square test for independence, but does not need the cell frequency minimum. The assumptions for the Chi-square test were not always satisfied for these data. Fisher's exact test does not produce a traditional test statistic like the common Chi-square test for independence. To test for significant associations between one dichotomous variable and one ordinal variable (frequent alcohol use), the Cochran-Armitage test for trend was employed. When a trend is present, this test is more powerful than the typical Chi-square test for association. All associations were tested for significance at $P<0.05$.

RESULTS

Respondent Demographics

A total of 1,500 surveys were distributed across the four campuses and 1,410 were completed for analysis; a 94% return rate. Approximately two-thirds of the respondents were female (63%) and one-third male (37%), which accurately reflects the gender distribution across the university system studied.[30] One-half were between the ages of 18-20 (50%) and about one-third lived in a residence hall (36%). Year in school was about evenly distributed across the sample.

Table 1. Variables Measured and Corresponding Survey Questions

Variable	Survey question and criteria for classification
Sexually active	Answered "yes" to: Have you ever had sexual intercourse?
Have ever used condoms	Answered "yes" to: During sexual intercourse, have you or your partner ever used a condom?
Ever had sex without a condom	Answered "yes" to: Have you ever had sexual intercourse without the use of a condom?
Uses condoms frequently	Answered "more than half the time" to: 1. During the past 3 months, if you had sexual intercourse, how often did you or your partner wear a condom? Or Answered "no" to: 2. Have you ever had sexual intercourse without the use of a condom?
Frequent alcohol use	Ordinal variable representing the number to drinks reported: What is the average number of drinks you consume in a typical week?
Previous binge drinking	Answered "yes" to: Have you had 5 or more drinks in one sitting during the past 2 weeks?
Testing History of HIV Testing History of STDs STD Treatment History	Answer of "yes" to any of the following: Have you ever been tested for HIV? Have you ever been tested for an STD? Have you ever been treated for an STD?

Overall, 83% of students surveyed reported having previously had sexual intercourse, with slightly higher rates for females (86%) than males (78%). Sexual behavior increased with class rank, with more seniors (91%) reporting being sexually active than freshmen (76%). Respondent demographics are provided in Table 2.

Condom Use

All further analyses for this study were conducted with the subgroup of students who reported having had sexual intercourse in the past (n=1,126). Respondents who did not answer all questions for each specific analysis were eliminated from that analysis. The results for condom use are provided in Table 3. When asked if they had ever used a condom in the past, almost all students reported that they had (89.6%) with males (92%) reporting slightly higher use than females (88.2%). With regard to having sexual intercourse without using a condom however, a majority of students reported having had unprotected sex in the past (83.1%) and females (85.7%) were significantly more likely to have engaged in this behavior than males (78.4%).

A majority of both males (74.7%) and females (85.5%) reported that using condoms was a joint decision between them and their sexual partner and this difference was statistically significant (P<0.001). When students were asked if they would have sex with a partner who refused to use condoms, only 13.6% reported that they would. The majority said they would not (62.6%), and 23.8% indicated "do not know." When analyzed by gender, significantly fewer females (8%) than males (24.2%) reported that they would have sex without a condom in this situation (P<0.001).

Students were asked to report their use of condoms over the previous three months. In total, 45.4% of students reported that they had used condoms more than half the time; 16.3% reported less than half the time; 34.9% had not used condoms at all; and 3.4% did not recall. The variable *frequent condom use* was analyzed by gender and it was found that males (52.7%) were significantly more likely to report frequent use of condoms (P=0.015) than females (44.1%).

HIV/STD Testing Behaviors

Overall, 52.5% of students surveyed reported that they had been tested for an STD and 37.1% reported having been tested for HIV (Table 3). Females (61.3%) were significantly more likely to report having had an STD test (P<0.001) than males (36.2%). Although not significant (P=0.190), females (38.7%) were also more apt to report having had an HIV test than males (33.8%). A small percentage of students in this sample (9.7%) reported having been treated for an STD and there were no significant differences in reporting based on gender.

Table 2. Survey Respondent Demographics

Characteristics	Total Sample (n = 1410)	Percent Sexually Active (n=1126)
Total	100%	83%
Gender		
Female	63%	86%
Male	37%	78%
Age		
Between 18 - 20 years of age	50%	78%
21-25 years of age	40%	88%
Over 25	10%	92%
Living Arrangement		
Living with parents or spouse	51%	82%
Living on campus	36%	82%
Living off campus (not with parents or spouse)	13%	90%
Year in School		
Freshman	27%	76%
Sophomore	22%	82%
Junior	24%	85%
Senior	27%	91%
Sexual Orientation		
Heterosexual	96.1%	84%
Homosexual	1.5%	81%
Bisexual	2.4%	90%

Association between Condom Use and HIV/STD Testing and Treatment Behaviors

Students who had been tested for HIV or for STDs were significantly *less* likely to report having ever used condoms (P=0.006 and P=0.004, respectively) or using condoms frequently (P<0.001 and P<0.001 respectively). There was no significant relationship between STD treatment history and ever using condoms but students who had been treated for STDs were significantly *less* likely to report using condoms frequently (P=0.005).

Among females, those who had been tested for HIV or for STDs were significantly *less* likely to report having ever used condoms (P=0.009 and P=0.023, respectively) or using condoms frequently (P<0.001 and P<0.001 respectively). Also significant was the relationship between STD treatment history and frequent condom use (P=0.020) with females who had been treated for an STD being *less* likely to use condoms frequently. STD treatment history was not related to ever using condoms among females. Among males, there were no significant associations between HIV/STD testing or treatment and either measure of condom use (Table 4).

Association between Condom Use and Alcohol Use

Data were analyzed for associations between frequent alcohol use and two measures of condom use: ever having sex without a condom and frequent condom use. For the entire sample, frequency of alcohol use was positively associated with non-use of condoms (P=0.002 for trend), meaning that the more frequently students reported drinking on average, the more likely they were to report ever not using condoms in the past. There were no statistically significant associations between frequent alcohol use and frequent condom use or between previous binge drinking behavior and either measure of condom use (Table 5).

When data were analyzed based on gender, both females and males demonstrated a significant association between frequency of alcohol use and having had sex without a condom (P=0.009 and P=0.021 respectively). As frequency of alcohol use increased, the probability of ever having not used condoms also increased. There were no significant associations between either measure of alcohol use and frequent condom use for females or males in this study.

DISCUSSION

This study explored gender differences with regard to HIV testing, STD testing, STD treatment, alcohol use, and condom use. One strength of the study was that data were collected across a four-university campus system and, because of the use of a stratified random sampling strategy and acquisition of a high response rate, the demographics of the sample for this study exactly match that of the student population of this system in the Northeastern United States.[30]

Students in this university system were found to be engaging in sexual behavior and doing so without regularly using condoms. Further, despite this risk of HIV/STD transmission, students reported low rates of HIV and STD testing behaviors. Overall, STD and HIV testing rates were 52.5% and 37% respectively with higher rates reported among females. Although these testing rates were higher among our study population than what has been reported at other universities,[17,18] they are still low considering the CDC's recommendations for HIV screening.[15] This low testing rate is not surprising as other studies on college HIV testing show that students still perceive their risk of contracting HIV and other sexually transmitted diseases to be low.[17,18] The finding that testing rates were higher in this population than national averages merits further investigation, specifically with regard to the types of testing recommendations that are provided in student health services on these campuses and other campus initiatives that may have been in place to promote HIV/STD testing.

This study found several gender differences in sexual behaviors. Females were significantly less likely than males to use condoms and more likely to have had an

Table 3. Gender Differences in Sexual Behavior among Sexually Active Students

	All students		Females	Males	
	n	% yes	% yes	% yes	*P*
Ever used a condom?	1112	89.6	88.2	92.0	0.051
Ever had sex without a condom?	1114	83.1	85.7	78.4	0.005**
Condom use is a joint decision between them and their sexual partner	1034	81.6	85.5	74.7	<0.001**
Would have sex if partner said no to condom?	1101	13.6	8.0	24.2	<0.001**
Used condoms more than half the time during the previous 3 months	959	45.4	44.1	52.7	0.015*
Ever been tested for HIV?	1111	37.1	38.7	33.8	0.190
Ever been tested for an STD?	1114	52.5	61.3	36.2	<0.001**
Ever been treated for an STD?	1109	9.7	10.9	7.5	0.072

* $P < 0.05$
** $P < 0.01$

STD test. This finding is also consistent with previous literature.[17,18] Data showing differences in safer sex practices between college males and females have been widely and historically documented[27,28] and consistently show that females report using barrier methods (like condoms) less frequently than males, but are seeking HIV/STD testing more often. Furthermore, females report using birth control-only methods (such as oral contraceptives) as the primary way to protect themselves.[31] This higher rate of testing may also be attributed in part to the fact that testing is part of routine gynecological care for unmarried, heterosexual females.

The most striking and unique findings from this study were related to the exploration of the relationship between HIV testing or STD treatment and condom use. Interestingly, for the entire sample of students, analysis revealed a statistically significant negative association between these variables. Students who had been tested for HIV or treated for STDs were significantly less likely to have ever used condoms or use condoms frequently. When analyzed based on gender however, this significant negative association was only present for females, and not for males. One possible explanation for this negative association may be that students who engage in more risky sexual behaviors are more apt to seek out testing as a way of prevention, but that testing itself does not change a college student's behavior.[24] The outcome of a negative HIV or an STD test after engaging in risky sexual behaviors may actually serve to reinforce beliefs that as college students they are not at risk. However, the reasons for the gender difference observed in the relationship between HIV/STD testing and condom use is less clear and merits further exploration. It is possible that the combination of factors, including preferences for alternate forms of birth control (i.e., birth control pills), and greater access to HIV/STD testing through routine gynecological care, are confounding factors in this analysis. Further study with more detailed and extensive questionnaires would allow for the elimination of these potential confounding factors and lead to a greater understanding of this finding.

Consistent with other studies, students with a prior history of frequent alcohol use were also more likely to report ever not using condoms.[4] This association was significant for both males and females when tested separately based on gender.

Limitations

As with any survey research, this study is not without limitations. Results reflect self-reported behavior by undergraduates at a northeastern system of state universities. The sample size is reasonable and was randomly selected however results may not reflect the reported behaviors of all students across the university system. Another limitation to the survey is that race and marital/partner status were not included as demographic questions. The larger survey was an existing instrument that was developed in the 1980s and continues to be utilized by the entire university system to track trends in student health behaviors. The authors were provided with the opportunity to include sexual behavior questions in this distribution of the survey; however, the remaining questions of the survey could not be changed. Further, it is impossible from the survey responses to know when students had been tested for HIV/STDs or treated for STDs, which would help in further understanding their condom use behaviors. Finally, the survey questions were developed for the purpose of frequency and trend analysis and some of our study analysis goes beyond these. These results must not be viewed as illustrating causation, only association. Despite these limitations, these results provide an important contribution to the literature, especially as it relates to gender differences in HIV/STD testing, condom use, and the relationship between these variables.

TRANSLATION TO HEALTH EDUCATION PRACTICE

Many health educators work in college health education or are college professors with extensive contact with undergraduate students. In fact, many teach personal health classes during their tenure as university faculty and may even collaborate with their

Table 4. Gender Differences in the Relationship between Condom Use and HIV/STD Testing and Treatment Experience

	Ever used condoms (% yes)	*P*		Frequent condom Use (% yes)	*P*
Ever had HIV test					
All students		0.006**			<0.001**
Yes	85.6%	–		38.9%	–
No	91.4%	–		52.0%	–
Females		0.009**			<0.001**
Yes	83.8%	–		35.7%	–
No	90.6%	–		49.7%	–
Males		0.430			0.119
Yes	89.3%	–		46.3%	–
No	92.6%	–		55.9%	–
Ever had STD test					
All students		0.004**			<0.001**
Yes	86.7%	–		39.4%	–
No	92.6%	–		56.2%	–
Females		0.023*			<0.001**
Yes	85.6%	–		36.9%	–
No	91.6%	–		56.1%	–
Males		0.339			0.124
Yes	89.9%	–		47.0%	–
No	92.8%	–		56.7%	–
Ever been treated for STD					
All students		0.410			0.005**
Yes	87.0%	–		33.3%	–
No	89.6%	–		48.6%	–
Females		0.096			0.020*
Yes	82.0%	–		30.4%	–
No	88.7%	–		45.6%	–
Males		0.151			0.305
Yes	100%	–		42.3%	–
No	91.2%	–		54.3%	–

* $P < 0.05$
** $P < 0.01$

universities' health and wellness centers on health promotion programming. Given this unique opportunity to make positive health changes among undergraduates, these results easily translate into both programmatic objectives as well as curricula to be used on college campuses.

With the large majority of college students claiming to have had unprotected sex, it is important to encourage HIV/STD testing as well as to promote condom use and provide access to condoms. Although higher than other documented studies, results revealed rates of HIV/STD testing lower than what is recommended for college students. Reasons for low testing could be due to low perceived risk of contracting HIV/STDs or because of not knowing where to get tested. Testing for HIV/STDs is particularly important with this population due to the fact that students are admitting to having

unprotected sex and college students tend to have multiple partners. An important component of college health promotion programs for HIV/STD preventions and testing would be to dispel the myths of perceived risk and to broadly promote the testing services available either on campus or in the local community.

Condom use and HIV/STD testing attitudes and behaviors among the college population have not changed much over the years.[32,33] Health educators know the importance of first conducting comprehensive assessments[34,35] to determine the best intervention strategies to reach desired outcomes and goals. Surveys, such as the one described in this article, can serve as one way to collect behavioral data from a college population. Next, in-depth, qualitative data on both individuals and the community can be gleaned to further develop our program plan. Further, when providing HIV testing on college campuses, students must be dissuaded from gaining confidence from negative HIV/STD test results, since it is likely that they did "dodge a bullet" and may not be as lucky next time.

Programming on the campuses involved in this study includes a great deal of education on the benefits of safer sex and HIV/STD testing, but limited on-campus testing opportunities, minimal social marketing on the benefits of condom use, and limited access to free condoms and other safer sex materials. College health educators should consider a social ecological approach[36] to programming around HIV/STD testing and safer sex awareness. Such an approach would target individual student behaviors, like attitudes and knowledge about the test, HIV/STD risks, but also interpersonal, organizational, and community level targets as well. Multi-level interventions should include such components as increasing testing hours on campus, improving privacy around the counseling and testing process, campus-wide marketing campaigns on testing and counseling services, changing social norms[37] around HIV testing and condom use, and making sure that male and female condoms are made widely available and promoted. By providing multiple levels of intervention, college student behavior change will be supported and sustained.

Table 5. Gender Differences in the Relationship between Condom Use and Alcohol Behaviors

	Ever had sex without a condom	Frequent condom use
	P	*P*
Frequent alcohol use behavior		
All students	0.002**	0.284
Females	0.009**	0.967
Males	0.021*	0.634
Previous binge drinking behavior		
All students	0.100	0.444
Females	0.179	0.793
Males	0.224	0.455

* $P < 0.05$
** $P < 0.01$

College health education efforts should be coordinated in their approach on condom use. For example, multiple campus departments may unite to enhance their resources to provide more appropriate materials and interventions on condom use. If students with a prior history of alcohol use are less likely to use condoms, then the alcohol programming department should emphasize the importance of condom use in its presentations and other educational opportunities on responsible drinking. Campus-wide interventions using a social norms or social marketing campaign should be used to increase the popularity of condom use, especially among female students to counteract the potential consequences of their risky behaviors.

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