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ABSTRACT

Objectives. To determine if there is a relationship between binge drinking and risky sexual behavior in Vermont high schoolers.

Methods. We used data from the 2019 Vermont Youth Risk Behavior Survey, a survey administered every other year in high schools across Vermont asking students questions about various habits and behaviors. We used binary logistic regression to determine the association between binge drinking in the past 30 days and condom usage at last sexual intercourse.

Results. Binge drinking within the past 30 days was found to have increased odds of students not using a condom during intercourse (OR=0.782) when adjusting for covariates of gender, marijuana, tobacco, and cigarette use. Students who refrained from smoking marijuana, cigarettes, or vaping were more like to use a condom.

Conclusions. Binge drinking is associated with risky behaviors in Vermont teens. This population may benefit from education about the relationship between binge drinking and unprotected sex.

INTRODUCTION

Binge drinking is defined by the National Institute on Alcohol Abuse and Alcoholism as consuming 4 or more drinks (female) or 5 or more drinks (male) in a two-hour period, or a pattern of drinking that raises a person's blood alcohol concentration to 0.08.¹ In the United States, the legal age for alcohol consumption is 21 years.

Adolescents are known to binge drink, which is associated with other risky behaviors.² Studies have shown a positive correlation between binge drinking and not using a condom.³⁻⁴ Both binge drinking and unprotected sex may also be associated with gender, sexual orientation, age, tobacco use, and marijuana or other drug use.⁵⁻⁶ The literature demonstrates a relationship between binge drinking and unprotected sex among populations in other countries, such as Brazil, as well as in large cities.³⁻⁵ These populations may engage in binge drinking and risky sexual behaviors differently than predominantly rural populations such as Vermont. Characterizing this relationship among Vermont adolescents can provide insight on how to prevent unwanted consequences of unprotected sex in a predominantly rural population.

This study investigated the association between binge drinking and unprotected intercourse among Vermont high school students using data from the 2019 Youth Risk Behavior Survey (YRBS). Our hypothesis was that binge drinking is positively associated with unprotected sex among Vermont high school students

METHODS

The current study used cross-sectional study data from the 2019 YRBS, which included 18,613 high school students.⁷ This study employed χ^2 tests of independence ($\alpha=0.05$), binary logistic regression ($\alpha=0.05$), and descriptive statistics tests to determine potential associations among binge drinking, gender, and condom use. Three covariates, marijuana, tobacco, and cigarette use were defined by either those who have or have not used the substance before. Age as a covariate was defined by how old each participant was in years. Gender as a covariate was controlled for by males and females. Lastly, sexual identity as a covariate was controlled by either identifying as heterosexual or not heterosexual.

The binge drinking variables were defined as “has binge drank in the past 30 days” and “has not binge drank in the past 30 days.” The condom use variables were defined as “has used a condom during intercourse in the past 30 days” and “has not used a condom during intercourse in the past 30 days.” Students who responded that they have not had sex were removed from the analyses. Statistical analyses were performed using SPSS Statistics 28. The University of Vermont Institutional Review Board has reviewed this project and determined that it qualifies as exempt from additional review.

RESULTS

The study population was characterized using descriptive statistics. Participants who answered ‘Never had sex’ to question 63, “Have you used a condom in the past 30 days” were excluded from further analysis. Students under the age of 14 were also excluded from the analysis due to insufficient cases. Over 50% of the study population did not participate in binge drinking within the last 30 days. The highest frequency of binge drinking was 1 to 5 days of consistent drinking in the last 30 days. 14.4% of the study population said “No” to condom use during intercourse within the last 30 days. Slightly less than 15.5% of students participated in some level of binge drinking and did not use condoms during sexual intercourse in the last 30 days.

The relationship between condom use and binge drinking was significant, $\chi^2(1, df=1, P<.01)$. Habits of binge drinking within the past 30 days were statistically significantly associated with condom use, $P<.01$. Marijuana, tobacco, and cigarette use were identified as covariates and all had a significant impact on condom use, $P<.01$. Age, gender, and sexual identification were also identified as covariates; all had significant relationships to condom use, $P<.01$, except for 17-year-old students ($OR = 1.04$; 95% CI: 1.26, 1.62). After adjusting for covariates, binge drinking within the past 30 days was found to have an increased odds of students not using a condom, ($OR = 0.78$; 95% CI: 0.67, 0.91) (Table 4). Females were more likely than males to not use a condom ($OR = 1.43$; 95% CI: 1.26, 1.62) (Table 1). Students who refrained from smoking marijuana, cigarettes or vaping were more likely to use a condom (Table 1). Heterosexual students were also more likely than non-heterosexual students to use condoms ($OR = 0.63$; 95% CI: 0.53, 0.74) (Table 1).

DISCUSSION

Vermont high school students who do not binge drink are more likely than those who do binge drink to use a condom during sex when controlling for age, gender, sexual identity, marijuana, cigarette and vape use ($OR = 0.78$; 95% CI: 0.67, 0.91). Those who identify as heterosexual were more likely than those who do not to utilize condoms ($OR = 0.62$, CI: 0.53, 0.74). Students who used marijuana, cigarettes and vapes were all less likely to use a condom, ($OR_{\text{marijuana use}} = 0.76$; 95% CI: 0.65, 0.88, $OR_{\text{cigarette/vape use}} = 0.68$; 95% CI: 0.58, 0.79). Females were less likely than males to use a condom ($OR = 1.43$; 95% CI: 1.26, 1.62), which could be attributed to lack of clarity in the survey question.

Our findings may be limited by our inability to control for other potentially important confounders or covariates in the relationship between binge drinking and unprotected sex. For example, data on participants' use of other forms of birth control is a potentially important covariate. The YRBS is also a self-reported survey, which introduces potential for recall bias. Despite these limitations, these results still demonstrate that binge drinking can be an indicator of an increased risk for unprotected sex among high school students.

Vermont high school students were the population of interest and the Vermont Department of Health as well as the Vermont Agency of Education can use this information to craft programs tailored to this population. Parents, coaches, teachers and primary care providers (PCPs) can be made aware of these findings. The Department of Health uses state and federal funds for some programs one of which is the Personal Responsibility Education Program (PREP) which was created to provide sexual education to adolescents from underrepresented communities, are homeless or have some other disadvantage that would result in a benefit derived from the extra resources.⁸ Community health initiatives can be integrated with PREP to specifically serve underrepresented populations and perhaps as a model for how to ensure that more high school students in the state are educated about how binge drinking and unprotected sex are connected. Our study suggests that there was at least a small increase in risk of unprotected sex when Vermont high school students binge drink, thus it is important that students be educated on this risk. Often, binge drinking has been treated as its own issue;

however, we demonstrated the need to address the indirect impacts of binge drinking on adolescent health as well.⁹

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Table 1: Binary Logistic Regression for Binge Drinking and Condom Use in VT High School Students

	OR (95% CI)
Main predictor variable	
Binge Drinking	.782** (0.674, 0.907)
Control variables	
Age	
14 years old	0.536** (0.390, 0.737)
15 years old	0.656** (0.533, 0.806)
16 years old	0.802** (0.669, 0.963)
17 years old	1.044 (.875, 1.245)
Female	1.429** (1.264, 1.616)
Marijuana Use	0.756** (0.649, 0.879)
Sexual Identity	0.627** (0.535, 0.736)
Cigarette or Vape Use	0.679** (0.584, 0.790)

