

2019

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### Recommended Citation

Idman-Rait, Cecilia; Fischer, Karly; Callaghan, Shirley; Danis, Rachel; Rettenmaier, Caitlin; and Shepard, Michelle, "Adolescent Alcohol Usage in Vermont State: A Review of Underage Drinking and its Associations with Suicidality" (2019). *Master of Public Health Culminating Projects*. 6.  
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# Adolescent Alcohol Usage in Vermont: Assessing the Association Between Binge Drinking and Suicidality

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## ABSTRACT

**Objective** To understand adolescent alcohol usage in Vermont and its associations with suicidality. **Methods** A cross-sectional study, utilizing 2017 high school VT YRBS data. Multiple logistic regression and chi-square tests were run using SPSS 25 software. Two groups of survey respondents were selected to represent alcohol usage, Binge Drinkers and Non-Binge Drinkers. Suicidality was analyzed by group, controlling for the predictor variables: age of first drink, grade level, gender, mental health/depression diagnosis, other drug usage, socioeconomic status, and ease of access to alcohol. **Results** This study provides state-specific data regarding increased likelihoods of suicide and underage drinking in Vermont. **Conclusions** Binge drinking activity amongst Vermont's high school aged youth was associated with a two-fold increase in the odds of making a suicide plan. **Policy Implications** The association between suicidality and binge drinking among Vermont high school-aged youth should be used to inform education and policies to decrease teen binge drinking.

## INTRODUCTION

In 2016 more than 45,000 Americans died by suicide<sup>1</sup> representing a major public health concern. Suicide is the second leading cause of death among children and adolescents age 10 to 24 years, with only accidental injury accounting for more deaths.<sup>2</sup> For every death by suicide in adolescents there are up to twenty-five nonfatal suicide attempts.<sup>3</sup> In Vermont, the rate of suicide is more than 17/100,000 people, higher than the national rate of 13/100,000.<sup>2</sup> Data from the Vermont Youth Risk Behavior Survey (VT YRBS) showed a substantial increase in the number of adolescents planning or attempting suicide between 2007 and 2017.<sup>4</sup> Alcohol use can worsen psychological distress, precipitate depressed mood and anxiety.<sup>5</sup> Cognitive constriction is observed prior to suicide attempts and alcohol can play an important role in exacerbating this.<sup>6</sup>

Self-reported alcohol use in VT adolescents declined between 2007 and 2015 but increased between the 2015 and 2017 YRBS surveys.<sup>4</sup> On the 2017 VT YRBS, 57% of high school students reported having the first drink of alcohol between ages 8 and 17 years.<sup>4</sup> In the same year 1,108 Vermont teens said they had attempted suicide in the past 12 months and 2,304

said they made a suicide plan.<sup>4</sup> Analysis of 2015 VT YRBS data found a significant relationship between binge drinking alcohol in the past 30 days and making a suicide plan in the past year.<sup>7</sup> In addition, alcohol use in adolescents experiencing symptoms of depression led to a threefold increase in reported suicide attempts.<sup>8</sup>

Identifying associations between current alcohol use and suicidal ideation in adolescents can inform policies and education around suicide prevention for high school aged youth. In this study, the 2017 VT YRBS dataset was analyzed for potential associations between reported alcohol use and suicide plan or attempts.

## METHODS

A cross sectional study was conducted to investigate associations between underage drinking and suicidality among 20,653 Vermont high school students who responded to the 2017 VT YRBS. Underage alcohol usage, identified as binge drinking, was the primary exposure. Suicidality was the primary outcome, composed of two factors: (1) making a suicide plan and (2) reported suicide attempts. Covariates were status of depressed mood, grade, sex, age of first drink, ease of access to alcohol, and current marijuana use, stratified by gender and grade. SPSS v25 (IBM Armonk, NY) analytical software was used for binary logistic regression, and chi-square tests were used to compare proportions. The University of Vermont Institutional Review Board has reviewed this project and determined that it qualifies as exempt from additional review.

## RESULTS

Demographic measures were gender identity, sexual orientation, grade, and race (Table1).

Vermont Youth Risk Behavior Surveillance (YRBS) Survey Results 2017 Demographic Information <sup>1</sup>			
High School Participants		N*	Weighted %
<b>Total</b>		20,653	N/A
<b>Gender Identity &amp; Sexual Orientation</b>	Male	9,985	51%
	Female	10,334	49%
	Heterosexual/Cisgender (Het)	N/A	89%
	Lesbian, Gay, Bisexual, or Transgender (LGBT)	N/A	11%
<b>Grade</b>	9th Grade	5,573	25%
	10th Grade	5,491	25%
	11th Grade	4,987	25%
	12th Grade	4,318	25%
<b>Race</b>	White, non-Hispanic	14,551	84%
	Students of Color (REM: Racial & Ethnic Minority)	N/A	16%
	Asian/Pacific Islander/Native Hawaiian	622	N/A
	Black/African American	403	N/A
	Hispanic/Latino	756	N/A
	Native American/Alaska Native	278	N/A
	Multiracial	767	N/A
	Other, unknown, or missing	558	N/A
<i>* The number of students in each category represents the unweighted frequency of those completing the survey. Some students did not indicate their grade or gender. Therefore, totals by grade and gender and/or weighted percentages may not equal the overall total.</i>			
<b>Resources:</b>			
1) 2017 Vermont Youth Risk Behavior Survey - High School Results. May 2018.			

Table 1

Results showed associations between underage use of alcohol and suicidality among high school students in Vermont. Logistic regression controlling for status of depression, grade, sex, age of first drink, ease of access to alcohol, and current marijuana was used. The odds of making a suicide plan was double in current binge drinkers compared to non-binge drinking adolescents (OR 2.09; 95% CI 1.88-2.32; p=0.001). Including all covariates in the analysis decreased the relationship between binge drinking and making a suicide plan (OR 1.14; 95% CI 0.99-1.29; p=0.072). The odds of making a suicide plan was 13 times higher when students reported feeling sad or hopeless (OR 13.13; 95% CI 11.67-14.59; p=0.0001). Having their first drink before age 13 and using marijuana both increased the odds of planning suicide (OR 1.64; 95% CI 1.43-1.85; p=0.0001 and 1.48, 95% CI 1.29-1.65; p=0.0001 respectively). Hunger (measured by positive report of not having enough food and always or almost always going hungry) increased the odds of planning suicide by 80% (OR 1.80; 95% CI 1.42-2.19; p=0.0001).

The odds of attempted suicide was significantly higher in adolescents reporting binge drinking (OR 3.16; 95% CI 2.76-3.62; p=0.001). The odds of reported suicide attempt was also increased in adolescents feeling sad or hopeless (OR 13.85; 95% CI 11.45- 16.25; p=0.0001), currently using marijuana (OR 1.87; 95% CI 1.58-2.17; p=0.0001), and those who had their first drink before age 13 (OR 2.15; 95% CI 1.82-2.49; p=0.0001). Going hungry increased odds of attempting suicide almost 3 times (OR 3.17; 95% CI 2.43-3.90; p=0.0001).

Other variables were also found to significantly impact adolescent suicidality when controlling for binge drinking. Current use of marijuana increased the odds of both making a suicide plan and having attempted suicide (OR 2.67; 95% CI 2.44-2.92; p=0.0001 and 4.04; 95% CI 3.57-4.57, p=0.0001 respectively). The odds doubled in males compared to females for both planning suicide (OR 1.43; 95% CI 1.28-1.64; p=0.0001) and attempting suicide (OR 1.46; 95% CI 1.24-1.68 p=0.0001) when controlling for all other variables. Older youth (grades 11, 12 and ungraded) had higher odds of suicide attempts (OR 1.18; 95% CI 1.05-1.32; p=0.001), and for making a suicide plan (OR 1.13; 95% CI 1.03-1.22; p=0.007) compared to younger students (grades 9-10). Chi-square testing showed a statistically significant relationship between binge drinking and attempted suicide, p-value 0.0001 (P <.0005).

## **DISCUSSION**

This study found a correlation between underage alcohol usage and suicidality among high school students in Vermont. Specifically, binge drinking was associated with both making a suicide

plan and having a prior suicide attempt. These findings are consistent with other studies linking alcohol use and suicide risk in youth. Analysis of data from the National Study of Drug Use and Health found significant associations between the age of first alcohol use and subsequent suicide attempts.<sup>9</sup> Another study found prevalence estimates for suicide indicators were higher amongst binge drinkers regardless of mental health diagnosis.<sup>10</sup> Finally, a study of Georgia youth concluded that teen alcohol use initiation was an important risk factor for suicide attempts among adolescents, regardless of gender.<sup>11</sup>

This study has several limitations. First, question phrasing and response options were fixed as part of the YRBS design, limiting the available data and types of analyses that could be performed. Also, the survey respondents included only those present on the day of administration so home-schooled and absent students are not represented. Additionally, answering surveys in the presence of their peers may impact accuracy of answers due to confidentiality concerns. Recall bias and self-reporting issues could also be a limitation within the YRBS dataset. The survey did not include direct measures of socioeconomic status which may contribute to underage drinking and suicidality. Inherent limitations using data collected from Vermont high school students include small population size, predominantly rural populations, and lack of ethnic diversity which makes external validity difficult and limits generalizability to other populations. Finally, the cross-sectional nature of the study limits ability to assess causality between binge drinking and suicidal ideation in the population studied.

Future research should further explore this topic, but with a prospective cohort design. This could be costlier and more time consuming but would offer a stronger window into possible causal factors relating to alcohol and suicidality.

## **PUBLIC HEALTH IMPLICATIONS**

The association between suicidality and binge drinking among Vermont high school-aged youth should be used to further education and policies to decrease binge drinking among teens.

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