



# At-School Substance Use as a Marker for Serious Health Risks

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## ABSTRACT

**OBJECTIVE:** At-school substance use is associated with increased rates of violence and delinquency. However, whether at-school substance use is a useful marker for other serious health risks and whether this association varies by gender or substance is still unclear.

**METHODS:** We analyzed data from the national 2011 Youth Risk Behaviors Survey of 15,698 ninth to 12th grade students. We used multivariate regressions controlling for age and race and evaluated whether at-school marijuana and alcohol users were more likely than out-of-school users to exhibit 9 serious health risks (exposure to intoxicated driving, fighting, carrying a weapon at school, substance use with intercourse, experiencing intimate partner violence, being forced to have intercourse, experiencing depression, suicidal ideation, and attempting suicide). We included interaction terms to determine whether this association varied by gender or substance.

**RESULTS:** At-school alcohol and marijuana use were both associated with increased odds of all 9 serious health risks. The association between at-school substance use and fighting and being forced to have sex was greater for boys than for girls. Associations did not vary significantly by substance. Specificity of at-school substance use for serious health risks ranged from 0.93 to 0.96, and positive predictive values ranged from 0.23 to 0.69, well above the ranges for out-of-school use and nonuse.

**CONCLUSIONS:** Students found using alcohol or marijuana at school should be immediately and carefully screened for other serious health risks that pose significant present dangers; this might represent a critical opportunity to identify troubled youth.

**KEYWORDS:** alcohol use; gender; marijuana use; school health

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## WHAT'S NEW

For boys and girls, using alcohol or marijuana at school is associated with numerous serious health risks that threaten adolescent health and safety. Students found using substances on campus should be carefully screened for unmet mental and behavioral health needs.

SUBSTANCE USE ON school campus negatively affects the individual user and the larger school community.<sup>1,2</sup> Published reports of the 2011 Youth Risk Behavior Survey (YRBS) show that 4.9%, 5.1%, and 5.9% of students smoked cigarettes, drank alcohol, and used marijuana, respectively, on school property in the past 30 days.<sup>3</sup> Alarmingly, >25% of students had been offered, sold, or given an illegal drug on school property in the past 12 months<sup>3</sup> and up to a third of students had seen classmates under the influence of either alcohol or drugs at school.<sup>4</sup>

Most students report using drugs or alcohol off school property before using substances at school,<sup>5</sup> and many of the same factors (such as older age, male gender, and early onset of substance use) that predict higher rates of general

adolescent substance use also predict at-school use.<sup>6</sup> Marijuana and alcohol are the most commonly used substances, out-of-school and at-school. Compared with out-of-school use, however, at-school substance use is associated with higher levels of violence (fighting, weapon-carrying),<sup>6–9</sup> and more frequent overall substance use.<sup>8</sup> Additionally, among young men who report having same-sex partners, at-school substance use is associated with having more sexual partners overall.<sup>10</sup> These findings suggest that at-school users might constitute a sizable population who exhibit high levels of other health risks.

Studies suggest that at-school alcohol users might have a particularly high-risk profile. Although approximately half of adolescent marijuana users do so on school campus, less than one-fifth of adolescent drinkers report using alcohol at school.<sup>6</sup> Further, although at-school alcohol use is associated with fighting, vandalism, and rebelliousness,<sup>9</sup> the same has not been found for at-school marijuana use.<sup>8,11</sup>

Although teachers and school administrators are well aware of at-school substance use, most report uncertainty about how to respond to specific student drug and alcohol offenses.<sup>12–15</sup> There is a genuine lack of consensus on

whether at-school substance use is primarily a disciplinary problem or a sign of serious health risks in need of supportive intervention. If at-school substance use is a relatively isolated event, mostly unrelated to a student's larger health issues, then it might be appropriate to respond to this offense similarly to how other school offenses are handled. However, if using alcohol and marijuana at school is a marker for more widespread problems, then addressing these factors might be an important aspect of prevention and treatment. The Problem Behavior Theory suggests that adolescents engaging in 1 high risk health behavior are at increased risk of engaging in other potentially dangerous behaviors.<sup>16,17</sup> Because of the semipublic nature of at-school substance use, identifying whether at-school users are more likely to exhibit serious health risks, beyond substance use, can provide direction for parents, clinicians, and school officials confronted with a teen caught using substances on a school campus. Further, we know of no studies that directly assess whether associations between at-school substance use and serious health risks vary by gender.

To address this knowledge gap, we determined whether students who use alcohol and marijuana at school were more likely than out-of-school users to exhibit serious health risks. In addition, we investigated whether these relationships differed by gender and by alcohol versus marijuana use.

## METHODS

We analyzed the 2011 YRBS, a national, representative anonymous survey of 15,698 9th through 12th grade students attending schools throughout the United States. The YRBS has been administered through the Centers for Disease Control and Prevention biennially since 1990 to assess and monitor the prevalence of behaviors that affect the health of youth throughout the country, specifically focusing on those that most contribute to morbidity, mortality, disability, and social problems in youth and young adults. For the 2011 national survey, respondents were selected using a 3-stage cluster sample design (to select counties, schools, and classrooms), producing a representative sample of all US public, Catholic, and other private school students in grades 9 through 12, excluding Puerto Rico, the trust territories, and the Virgin Islands. A weighting factor was applied to each student record to adjust for nonresponse and the oversampling of black and Latino students in the sample. The final sample for the 2011 YRBS consisted of 15,698 students from 149 schools. The school response rate was 81% and the student response rate was 87% for an overall response rate of 71%. Local survey administrators followed parental permission procedures specific to the locality. In 2011, 10% of schools used active permission and 90% used passive permission procedures. Surveys were administered in school, during a single class period. Students self-administer the survey, entering their answers on a computer-scannable booklet or answer sheet. Students absent on the day of survey administration were surveyed on alternative days. Data from the 2011 YRBS are publicly available through the Centers for Disease Control and Prevention.<sup>18</sup>

## MEASURES

### SUBSTANCE USE

Students were asked on how many days during the previous month they had at least 1 drink of alcohol and had at least 1 drink of alcohol on school property. The 7 response categories ranged from 0 days to all 30 days. Students were also asked how many times in the past 30 days they used marijuana and used marijuana on school property. The 6 response categories ranged from 0 times to 40 or more times. Any response greater than 0 days or times was considered a positive dichotomous measure of any use or at-school use. We chose to dichotomize measures of at-school substance use to make the analysis most relevant to adults confronted with a student caught using alcohol or marijuana at school. We also performed a sensitivity analysis using the frequency of at-school substance use as a predictor. Students who reported using alcohol or marijuana in the previous 30 days, but did not report any use at school, were considered out-of-school users of that substance.

### SERIOUS HEALTH RISKS

Serious risk behaviors were selected for their potential to pose immediate and grave harm to youth. All behaviors available in the YRBS survey with the potential to cause immediate and significant morbidity and mortality, excluding those that constitute only other forms of substance use, were included for analysis. Students were asked about their frequency of riding in a car or other vehicle driven by someone who had been drinking alcohol and driving a car or other vehicle when they had been drinking alcohol in the previous 30 days. A response greater than 0 times to either item was considered a positive response to a dichotomous measure of exposure to intoxicated driving. Additionally, students were asked on how many times in the previous 12 months they had been in a physical fight and how many days out of the past 30 days they carried a weapon, such as a gun, knife, or club, on school property. Responses greater than 0 times or days were considered positive dichotomous measures of fighting and at-school weapon-carrying, respectively. A dichotomous measure of exposure to intimate partner violence was assessed by asking students whether their boyfriend or girlfriend ever hit, slapped, or physically hurt them on purpose during the past 12 months. Students were also asked whether they had been drinking alcohol or using drugs before the last time they had sexual intercourse and whether they had ever been physically forced to have sexual intercourse when they did not want to. To assess for symptoms of depression, students were asked whether, during the past 12 months, they ever felt so sad or hopeless almost every day for 2 weeks or more in a row that they stopped doing some usual activities. A positive response corresponded to a positive screen for depression risk using the Patient Health Questionnaire-2 (PHQ-2) questionnaire, which has been validated as an initial screener in adolescent populations.<sup>19</sup> To assess for suicidal ideation, students were asked whether they seriously considered attempting

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