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Brand preferences of underage drinkers who report alcohol-related fights and injuries

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Abstract

Background—A significant body of research has demonstrated an association between adolescent alcohol consumption and subsequent fights and injuries. To date, however, no research has identified which brands are associated with alcohol-related fights and injuries among underage drinkers.

Objectives—We aimed to: 1) report the prevalence of alcohol-related fights and injuries among a national sample of underage drinkers in the U.S. and 2) describe the relationship between specific alcohol brand consumption and these alcohol-related negative consequences.

Methods—We recruited 1,031 self-reported drinkers (ages 13–20 years) via an internet panel maintained by Knowledge Networks to complete an online survey. Respondents reported their past-month overall and brand-specific alcohol consumption, risky drinking behavior, and past-year alcohol-related fights and injuries.

Results—Over one-quarter of the respondents (26.7%, N=232) reported at least one alcohol-related fight or injury in the past year. Heavy episodic drinkers were over six times more likely to report one of these negative alcohol-related consequences (AOR: 6.4, 95% CI: 4.1–9.9). Respondents of black race and those from higher-income households were also significantly more likely to report that experience (AOR: 2.2, 95% CI: 1.3–3.7; AOR: 1.8, 95% CI: 1.1–3.0 and 1.1–3.2, respectively). We identified eight alcohol brands that were significantly associated with alcohol-related fights and injuries.

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Conclusions/Importance—Alcohol-related fights and injuries were frequently reported by adolescent respondents. Eight alcohol brands were significantly more popular among drinkers who experienced these adverse consequences. These results point to the need for further research on brand-specific correlates of underage drinking and negative health outcomes.

Keywords

Alcohol; brands; underage drinkers; adolescents; fights; injuries

Background

Worldwide, alcohol consumption among youth remains a serious public health concern. A significant body of research has demonstrated an association between adolescent alcohol consumption and subsequent negative health outcomes, including fights and injuries (Black, Asbridge, & Lea, 2009; Committee on Substance Abuse, 2010; Cunningham et al., 2011; Kim, Asrani, Shah, Kim, & Schneekloth, 2012; Laraque, Barlow, & Durkin, 1999; Madan, Beech, & Flint, 2001; Mannenbach, Hargarten, & Phelan, 1997; Meropol, Moscati, Lillis, Ballow, & Janicke, 1995; Murphy et al., 2009; Spirito, Rasile, Vinnick, Jelalian, & Arrigan, 1997; Spirito, Jelalian, Rasile, Rohrbeck, & Vinnick, 2000; Swahn, Simon, Hammig, & Guerrero, 2004; Verdurmen, Monshouwer, van Dorsselaer, ter Bogt, & Vollebergh, 2005). In their recent survey of U.S. hospital admissions among underage drinkers diagnosed with alcohol use disorder (AUD), Kim and colleagues found that 24.7% of the nearly 40,000 youth admissions classified with an AUD presented with an injury (Kim et al., 2012). AUD-related hospitalizations of underage drinkers in the United States cost approximately \$755 million—with more than half this total cost attributable to youth who sustained injuries. Such findings are not anomalous in the field of adolescent health; in fact, recent publications in *The American Journal of Surgery* and *The Journal of Trauma and Acute Care Surgery* recommend implementing routine alcohol screening for pediatric trauma patients beginning at either age 10 years (Ley et al., 2012) or 12 years (Kelleher, Renaud, Ehrlich, & Burd, 2013) due to the frequent comorbidity of alcohol misuse with traumatic injury.

Considering the substantial evidence that demonstrates an association between underage drinking and subsequent experiences of violence and injury, it is clear that alcohol use must be addressed in order to effectively prevent serious injury among youth. However, one element of the relationship between alcohol consumption and injury remains unexplained: what exactly are the youth who experience alcohol-related negative consequences drinking? Given the significant influence of alcohol branding and marketing on youth audiences, it is important to characterize the landscape of brand preference among underage drinkers whose health and well-being may be endangered by alcohol consumption. While a substantial literature documents the general relationship between alcohol and adolescent health, research has not yet identified which brands of alcohol are consumed by underage drinkers who report experiencing alcohol-related fights and injuries.

Objectives

The aim of this paper is to 1) report the prevalence of alcohol-related adverse consequences (fights, injuries, and injury-related medical visits) among a nationally representative sample

of underage drinkers in the U.S. and 2) describe what associations, if any, exist between brand-specific alcohol consumption and reported alcohol-related negative consequences. We hypothesize that alcohol-related fights and injuries will be more prevalent among respondents who also report engaging in heavy episodic drinking. Additionally, while the dearth of literature on underage drinkers' brand-level alcohol consumption prevents us from speculating about what types of alcohol are associated with these negative consequences, we anticipate seeing significant differences between the reported brand preferences of youth with versus without any history of alcohol-related fights and injuries. Specifically, given the nuanced differences between the brand personalities promoted by alcohol companies, and the resulting perceptions of consumers, we expect to see unique brand profiles associated with respondents' reported experiences of alcohol-related fights, injuries, and injury-related doctor visits.

Methods

Study Design

The details of the survey methodology have been published previously (Siegel et al., 2013). We surveyed 1,031 male and female underage drinkers using a pre-recruited internet panel maintained by Knowledge Networks (Palo Alto, CA), a research organization that specializes in conducting nationally representative online surveys (Knowledge Networks, 2013). Panelists ages 13–20 were invited via email to participate in an internet-based survey. All respondents first completed a multi-question screening questionnaire that did not indicate the purpose of the study. Those who reported consuming at least one drink of alcohol in the past 30 days were provided an online consent form to review and sign, after which they completed the survey. After finishing the questionnaire, respondents were paid \$25. The Institutional Review Board of the Boston University Medical Center approved this protocol.

Sample

Knowledge Networks maintains a pre-recruited panel of about 50,000 adults ages 18 and older who have agreed to periodically be invited to take part in internet-based surveys (Knowledge Networks, 2013). The company uses a combination of random digit dialing (RDD) and address based sampling (ABS) to recruit households from their nationally representative sampling frame (Knowledge Networks, 2013). For this study, we worked with Knowledge Networks to oversample telephone numbers from phone banks with higher concentrations of Black and Hispanic residents in order to ensure sufficient representation from these groups. Also note that to promote survey participation across different levels of socioeconomic status, Knowledge Networks provides internet access and training for free to any recruited respondent whose home does not have an internet connection.

Comparison of Respondents and Non-Respondents

Adolescents ages 13–17 were recruited through a parent or guardian who was enrolled as a Knowledge Networks panelist. As a result, an analysis of respondent versus non-respondent demographic factors was not possible for the younger youth sample.

The older youth sample of 18- to 20-year-olds was recruited from the pool of existing Knowledge Networks panelists, which did allow us to compare respondents and non-respondents on basic demographic characteristics. To help assess the nature of potential non-response bias, we used a chi-square test to assess the significance of observed differences between the two groups. Non-respondents were more likely to be Black ($p<0.0001$), to come from lower income households ($p<0.01$), and not to have had internet access when recruited ($p<0.0001$). The non-respondents were also slightly older ($p<0.05$), but similar in gender ($p=0.41$). No substantial differences by region were found ($p=0.11$).

Response Rate

We employed a modification of the American Association for Public Opinion Research (AAPOR) standards for response rate reporting, as developed by Callegaro and DiSogra (Callegaro & DiSogra, 2009). As the younger youth (13- to 17-year-olds) and older youth (18- to 20-year-olds) samples were recruited differently, we report their response rates separately. The screening completion rate for the older youth sample was 46.2% (2,288 invitations, with 1,058 completed screenings), and the survey completion rate was 93.8% (705 eligible respondents, with 661 completed surveys). Together, the overall response rate for the older youth was 43.4% (46.2% multiplied by 93.8%). The parent completion rate for the younger youth sample was 49.2% (an estimated 4,757 eligible households with one or more teens, with 2,341 parents giving consent). The screening completion rate was 94.0% (2,341 invitations, with 2,201 teens screened), and the survey completion rate was 95.9% (387 eligible respondents, with 371 completed surveys). Together, the overall response rate for the younger youth was 44.4% (49.2% multiplied by 94.0% multiplied by 95.9%).

Measures

Using an internet-based, self-administered questionnaire, we asked respondents to report on how many of the past 30 days they had at least one drink of alcohol and the average number of drinks they consumed on a day when they drank. To measure brand-specific alcohol consumption, we provided respondents with a list of alcohol brands (898 total) in each of these beverage categories: 306 table wines, 132 beers, 86 vodkas, 77 cordials/liqueurs, 62 flavored alcoholic beverages, 54 rums, 33 tequilas, 29 whiskeys, 27 gins, 25 scotches, 23 bourbons, 15 brandies, 10 spirits-based energy drinks, 9 cognacs, 5 low-end fortified wines, and 5 grain alcohols.

For each alcohol category, the respondents indicated which specific brands they had consumed during the past 30 days. If a particular brand was not listed, then respondents were asked to provide as specific a name as possible. After identifying the universe of brands they had consumed recently, respondents then reported on how many of the past 30 days they had consumed each brand and then the average number of drinks of each brand they usually had on a day when they drank that brand.

We defined “drink” according to the NIAAA definition of a “standard drink,” which is a drink size containing 14 grams of pure alcohol (National Institute on Alcohol Abuse and Alcoholism (NIAAA), 2014). Therefore, we considered the following beverage amounts to be a standard drink: a 12-ounce can or bottle of beer; a 12-ounce wine cooler; 8.5 ounces of

malt liquor; an 8.5-ounce flavored alcoholic beverage; an 8-ounce alcohol energy drink; a 5-ounce glass of wine or champagne; 4 ounces of low-end fortified wine; 2.5 ounces of cordials or liqueurs (in a mixed drink or alone); 1.5 ounces of liquor (spirits or hard alcohol, in a mixed drink or alone); and 1 ounce of grain alcohol (in a mixed drink or alone).

To assess respondents' experiences of alcohol-related negative consequences, we asked the following questions: 1) "During the past 12 months, how often did you get into a physical fight while or after drinking?" 2) "During the past 12 months, how often did you have an injury where any part of your body was hurt while or after drinking?" 3) For those who reported an alcohol-related injury in the past year: "Of the times when you were injured, how many of those times was the injury serious enough that a medical professional was consulted?" For each question, the following response options were provided: "Never," "Once," "Twice," "3 or 4 times," "5 or more times," and "I don't know."

Validation of Methodology

Validation studies have shown that behavioral data obtained from the Knowledge Networks panel compare closely with estimates obtained from commonly-employed research methods such as national household, telephone, or in-person surveys (Bethell, Fiorillo, Lansky, Hendryx, & Knickman, 2004; Chang & Krosnick, 2009; Heeren et al., 2008; Novak, Kroutil, Williams, & Van Brunt, 2007; Smith, 2003; Yeager et al., 2011). Additionally, previous research has shown that data on self-reported drinking behavior obtained through a Knowledge Networks survey were similar to those from the National Epidemiologic Survey on Alcohol and Related Conditions, or NESARC (Heeren et al., 2008). Therefore, the Knowledge Networks panel is a less expensive but similarly effective alternative to telephone and in-person surveys to assess alcohol use behavior.

Furthermore, we conducted a full pilot test using the same survey methods described for the current study, but with a restricted sample size of 100 completed surveys among 16- to 20-year-olds (Siegel et al., 2011). We then we compared our pilot study findings for the older youth respondents (18- to 20-year-olds) to the results of the 2007 MRI Survey of the Adult Consumer, which provides data on alcohol beverage preferences by type (Siegel et al., 2011). The similarity between the results from these two sources demonstrated the validity of our methodology for identifying beverage type-specific patterns of alcohol consumption among underage drinkers, offering support for the use of these methods in assessing brand-specific consumption.

Weighting Procedures

Knowledge Networks applied statistical weighting adjustments to the data in order to account for selection deviations and to ensure that the sample's responses would be representative of the population (DiSogra, 2009). These weights adjusted for the different selection probabilities concomitant with the ABS- and RDD- based samples, and accounted for our oversampling of minority communities as well as for non-response to panel recruitment and panel attrition. Post-stratification weights (based on demographic distributions from the Current Population Survey [CPS] conducted by the U.S. Bureau of the Census) were applied to adjust for characteristics such as gender, age, race/ethnicity, region,

household income, household size, home ownership status, and residence in a metropolitan area.

Statistical Analysis

We determined the percentage of respondents who reported experiencing any alcohol-related fights, injuries, or injury-related medical visits at least once in the past year, both overall and broken down by the respondents' demographic characteristics and self-reported drinking behaviors. We similarly examined the percentage of respondents who reported each type of negative consequence.

To test predictors of experiencing any of the three alcohol-related negative consequences, we performed a series of logistic regressions adjusted for age, sex, race/ethnicity, household income, number of brands consumed, and heavy episodic drinker status (for both males and females, consumption of five or more drinks in one sitting in the past 30 days).

Next, we identified the most popular brands among the group of underage drinkers who reported any alcohol-related fights, injuries, or injury-related medical visits in the past year. To do so, we calculated weighted frequencies of past 30-day brand-specific consumption prevalence for these respondents and then ranked the results in descending order to reveal the top 25 brands. For this same group, we also determined brand-specific prevalence for reported episodes of heavy episodic drinking in the past 30 days. To calculate each brand's overall market share among this group of respondents, we took the total number of drinks consumed in the past 30 days that could be attributed to the brand and then divided by the total number of drinks for all brands included in the study.

Finally, to determine the predictive value of each top alcohol brand on the odds of reporting any of the three alcohol-related negative consequences, we performed a set of logistic regression analyses that controlled for sex, age, race/ethnicity, household income, having eight or more drinks (for females) or ten or more drinks (for males) in one sitting, number of brands consumed, number of brands consumed during heavy episodic drinking, and status as a frequent heavy episodic drinker (consuming five or more drinks in one sitting, three or more times in the past 30 days).

Results

Prevalence of Alcohol-related Fights and Injuries

Over one-quarter of the respondents (26.7%) reported at least one alcohol-related negative consequence in the past year (Table 1). Black respondents were over twice as likely to report at least one consequence (AOR: 2.2, 95% CI: 1.3–3.7), while respondents in both the medium (\$40,000–\$99,999) and high (\$100,000+) household income brackets were 80% more likely (AOR: 1.8, 95% CI: 1.1–3.0 and 1.1–3.2, respectively). Being in an alcohol-related fight was reported by 13.3% of the respondents, while experiencing an injury was reported by 21.4% and an injury-related medical visit was reported by 4.3% (Table 2).

Youth who reported engaging in recent risky drinking behavior had significantly higher odds of experiencing any of these alcohol-related consequences (Table 1). Those who

reported engaging in heavy episodic drinking during the past 30 days were over six times more likely to report such a consequence (AOR: 6.4, 95% CI: 4.1–9.9). Those who reported frequent heavy episodic drinking were twice as likely to do so (AOR: 2.2, 95% CI: 1.5–3.3), while those who reported even heavier consumption in the past 30 days (8 or more drinks for females, 10 or more drinks for males) were nearly three times more likely (AOR: 2.7, 95% CI: 1.8–4.1).

Top Brands among Youth Experiencing Alcohol-related Fights or Injuries

We identified the top 25 alcohol brands consumed by the respondents who reported experiencing any alcohol-related fights, injuries, or injury-related medical visits in the past year. Then, for this group of respondents, we determined each brand's overall consumption prevalence, its consumption prevalence during episodes of heavy episodic drinking, and its overall market share (Table 3). Bud Light had the highest consumption prevalence (35.0%) and market share (4.9%), and in the past 30 days was consumed by 22% of heavy episodic drinkers who reported a recent alcohol-related fight, injury, or injury-related medical visit. Other brands popular among drinkers reporting alcohol-related adverse consequences were Smirnoff Vodkas and Malt Beverages, Jack Daniels Whiskeys, Budweiser Beer, Coors Light, Absolut Vodka, and Captain Morgan Rums.

Brand Preferences of Youth Experiencing vs. Not Experiencing Alcohol-related Fights or Injuries

We next compared the past 30-day alcohol brand preferences of youth who did vs. did not experience any alcohol-related fights, injuries, or injury-related medical visits in the past year (Table 4). While some brands, such as Bud Light, were similarly prevalent among respondents who did (35.0%) and did not (25.3%) report these consequences, other brands were significantly more prevalent among the drinkers who reported them. Jack Daniels Whiskeys, for example, were consumed by 5.9% of those who reported no alcohol-related negative consequences and by 26.6% of respondents who did report a fight, injury, or injury-related medical visit (AOR: 2.2, 95% CI: 1.3–3.6). In the same way, Everclear 190 was consumed by less than 1% of respondents who did not report these negative consequences, but by 10.5% of respondents who did (AOR: 6.6, 95% CI: 2.1–20.8). Other brands with a significantly higher prevalence among the respondents who reported alcohol-related negative consequences include Absolut Vodkas, Heineken, Bacardi Rums, Bacardi Malt Beverages, Hennessy Cognacs, and Jack Daniels Cocktails.

Conclusions/Importance

Alcohol-related negative consequences—fights, injuries, and injury-related medical visits—were reported by more than one-quarter of the underage drinkers in our U.S. national sample. Specific demographic characteristics (higher household income, Black/African-American and “Other” race) were found to be significantly associated with an increased likelihood of reporting one or more of these negative consequences. Risky drinking behaviors were highly significant predictors, particularly heavy episodic drinking which was associated with a more than six-fold increase in the odds of reporting a fight, injury, or injury-related medical visit.

We identified the top 25 most popular brands of alcohol consumed by underage drinkers who reported one or more of these alcohol-related negative consequences, and then examined the consumption prevalence of these brands among respondents who did not report these consequences. Eight brands were significantly more popular among drinkers who reported an alcohol-related adverse consequence, even after controlling for demographic characteristics and alcohol consumption behaviors: Jack Daniels Whiskey and Jack Daniels Cocktails, Absolut Vodka, Heineken, Bacardi Rums, Bacardi Malt Beverages, Hennessy Cognacs, and Everclear 190. Notably, of these eight brands, half are distilled or “hard” liquors. The remaining four brands include two flavored alcoholic beverages, one cognac, and one beer.

These results indicate that a considerable proportion of youth are experiencing fights and injuries related to their drinking, and that the underage drinkers who suffer these outcomes are significantly more likely to drink certain brands compared to youth who do not report these consequences. While the brands with the highest market shares will likely be popular among any sample of drinkers, and while drinkers who report fights and injuries tend to drink heavily regardless of brand, we found statistically meaningful associations with these specific brands even after controlling for heavy episodic drinking and the number of brands each respondent consumed.

Limitations

The major limitation of our study is that we do not know what brands were consumed immediately before or during the fights and injuries reported by our sample. Instead, we can only assess which brands the youth who reported alcohol-related fights and injuries consumed in general. We attempted to overcome this limitation by conducting tests of association that controlled for multiple alcohol and brand consumption behaviors to reduce the likelihood that a significant finding was influenced by respondents’ overall drinking patterns. Unfortunately, we cannot compare the results of the present study to the MRI survey on adult beverage preferences like we did in the project pilot because the MRI survey does not collect any data on alcohol-related fights, injuries, or other consequences.

An additional limitation is the low response rates of 43% among 18- to 20-year-olds and 44% among 13- to 17-year-olds, which could potentially create a form of selection bias known as non-response bias. Based on a comparison of respondents and non-respondents, the primary concern is that both Black respondents and those from lower-income households were less likely to have completed the survey, and therefore that the survey may not be representative of the population of underage drinkers in the United States. To address the potential for non-response bias, we adjusted our estimates, via post-stratification, by weighting the survey responses from Black and lower-income respondents more heavily.

Conclusions

Given the wealth of evidence showing that youth are susceptible to alcohol brand marketing (Casswell, 2004; Chen, Grube, Bersamin, Walters, & Keefe, 2005; Chung et al., 2010; Collins, Ellickson, McCaffrey, & Hambarsoomians, 2005; Dal Cin, Worth, Dalton, & Sargent, 2008; Gordon, 2011; Grier & Kumanyika, 2010; Hastings, Anderson, Cooke, &

Gordon, 2005; Jackson, Hastings, Wheeler, Eadie, & MacKintosh, 2000; Jernigan, Ostroff, Ross, & O'Hara III, 2004; King et al., 2009; Nelson & McLeod, 2005; Primack, Nuzzo, Rice, & Sargent, 2012; Ross, Ostroff, & Jernigan, 2014), it is critical to understand the brand-specific consumption habits of underage drinkers—especially those who experience dangerous and potentially life-threatening consequences related to their drinking. Although there are likely many factors influencing why and how over one-quarter of adolescents in this sample experienced alcohol-related fights and injuries, the discovery of significant associations with a select few alcohol brands deserves attention and critical thought.

The brands that emerged as uniquely popular among youth with adverse alcohol-related consequences were predominately spirit-based, including four brands of distilled liquors (Jack Daniels Whiskey, Absolut Vodka, Bacardi Rum, Everclear 190) and one distilled brandy (Hennessy Cognacs). The remaining three were malted beverages: two flavored alcoholic beverages (Jack Daniels Cocktails, Bacardi Malt Beverages) and one beer (Heineken). The alcohol content by volume of these brands ranges from a high of 95% (Everclear 190) to a category midpoint of 40–47% (Bacardi Rum, Absolut Vodka, Jack Daniels Whiskey, Hennessy Cognac) to a low of 5% (Jack Daniels Cocktails, Bacardi Malt Beverages, Heineken beer).

Reviewing this list of brands, three points of discussion stand out. First, as mentioned previously, Everclear 190 was consumed by approximately 1 in 10 youth who reported fights and injuries, yet was rarely consumed by drinkers who reported no such consequences. Most striking about the Everclear 190 brand is its alcohol content—at 190 proof it is nearly 100% pure alcohol, and for this reason has been banned in 14 U.S. states. Everclear 190 is unique from the other brands popular among our sample because it is not typically consumed alone and often functions as a tasteless liquor to add to cocktails or large batches of pre-mixed drinks (often appearing in the colloquially named “jungle juice” at large parties). Therefore, it is possible that consumption of this brand is linked to alcohol-related adverse consequences due to its extraordinarily high alcohol content, its popularity as a flavorless mixer in beverages that may be appealing to youth, and its frequent consumption at parties or other group settings.

Second, an additional four out of these eight brands are also spirit-based and often mixed with other alcoholic or non-alcoholic beverages, which may lead to dangerous over consumption due to drinkers' inconsistent (or non-existent) measurement of standard drink sizes. Stated simply, it may be easier for adolescents to become intoxicated when consuming freely-poured liquor, which in turn may increase the likelihood that they engage in dangerous behaviors leading to fights or injuries.

Finally, of the remaining three brands, two are flavored alcoholic beverages (malt beverages or “alcopops”) that—while low in alcohol content—are sold in fruity and sweet flavors that may be appealing to youth and easier to drink in large quantities. Consumption of these drinks may feel deceptively agreeable to young and potentially novice drinkers, which could lead to an increased likelihood of intoxication and experiencing serious alcohol-related consequences.

Of course, this analysis is speculative—and since we controlled for heavy drinking in our regression analyses, it would seem that an additional independent relationship between brand preference and adverse drinking outcomes exists, regardless of whether these brands tend to be consumed in large quantities. That said, it was beyond the scope of the present study to examine the association of specific brand traits with alcohol behaviors. Thus, we cannot say with any certainty exactly which characteristics of these brands influence the nature and degree of alcohol-related consequences among youth. Clearly, this is an important area for future research. Specifically, future investigations should explore both quantitative (alcohol content, price, nature of consumption) and qualitative (brand personality, advertising content, primary brand messages) characteristics of the brands that are most strongly associated with negative alcohol-related consequences among youth. What must be emphasized, however, is that our findings suggest that brand-level preferences among youth do not simply represent trivial preferences or passing fads, but may in fact be directly tied to alcohol-related behaviors that put youth in harm's way.

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Glossary

Alcohol use disorder (AUD)	An AUD, categorized as alcohol abuse or dependence (i.e., alcoholism), is a pattern of alcohol consumption that leads to recurrent harmful consequences. Symptoms of an AUD may include inability to fulfill one's role or obligations, dangerous behavior when drinking (e.g., drunken driving), legal or psychosocial problems, an increased physical tolerance to and dependence on alcohol that leads to withdrawal when alcohol consumption ceases, and significant time and/or resources spent on alcohol
Heavy episodic drinking (or "binge" drinking)	This level of drinking is often defined as the consumption of 4 drinks or more (for women) or five drinks or more (for men) in one sitting. In the present study, consistent with the Monitoring the Future studies, we categorized both male and female respondents who reported consuming five or more drinks in a row during the past 30 days as heavy episodic drinkers (Johnston, O'Malley, P. M., Miech, R. A., Bachman, J. G., & Schulenberg, J. E., 2014)
Non-response bias	A form of selection bias whereby the characteristics of respondents who were sampled and chose to respond to a survey differ significantly from those of individuals who were sampled but did not participate
Market share	In the context of this study, market share is the proportion of respondents' alcohol consumption that can be attributed to a specific brand. It is calculated by dividing the total number of drinks for a single brand by the total number of drinks for all brands included in the study

Standard drink As defined by the National Institute on Alcohol Abuse and Alcoholism, a standard drink in the United States contains 14 grams of alcohol and is the equivalent to 12 ounces of beer, 5 ounces of wine, or 1.5 ounces of spirits (hard liquor)

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Table 1

Demographics and drinking behaviors of underage youth experiencing vs. not experiencing any alcohol-related fights, injuries, or injury-related medical visits

	Any Consequence % (SE)	No Consequences % (SE)	Odds Ratio ^{a,b} (95% CI)	Adj. Odds Ratio ^{a,b} (95% CI)
Overall sample:	26.7 (2.4)	73.3 (2.4)	-	-
Age:				
13–15 (N=117)	15.1 (4.4)	84.9 (4.4)	1.0	1.0
16–18 (N=461)	21.6 (2.5)	78.4 (2.5)	0.7* (0.5–0.9)	1.1 (0.6–2.1)
19–20 (N=453)	32.9 (4.0)	67.1 (4.0)	1.4* (1.2–1.6)	1.1 (0.8–1.5)
Sex:				
Male (N=428)	28.0 (3.6)	72.0 (3.6)	1.0	1.0
Female (N=603)	25.3 (3.0)	74.7 (3.0)	0.9 (0.7–1.2)	1.0 (0.7–1.3)
Race/ethnicity:				
White (N=592)	24.6 (2.9)	75.4 (2.9)	1.0	1.0
Black (N=126)	28.2 (8.2)	71.8 (8.2)	1.1 (0.7–1.7)	2.2* (1.3–3.7)
Hispanic (N=214)	25.5 (5.2)	74.5 (5.2)	0.9 (0.7–1.3)	1.3 (0.9–2.0)
Other (N=99)	42.1 (8.7)	57.9 (8.7)	2.1* (1.4–3.3)	4.9* (2.8–8.5)
Income:				
<\$15,000 (N=235)	24.2 (4.5)	75.8 (4.5)	1.0	1.0
\$15,000–\$39,999 (N=270)	23.6 (4.7)	76.4 (4.7)	0.8 (0.6–1.2)	0.8 (0.5–1.4)
\$40,000–\$99,999 (N=365)	30.4 (3.9)	69.6 (3.9)	1.4* (1.0–1.8)	1.8* (1.1–3.0)
>=\$100,000 (N=161)	24.5 (5.5)	75.5 (5.5)	0.9 (0.6–1.2)	1.8* (1.1–3.2)
Heavy episodic drinking^c				
No (N=519)	7.2 (1.4)	92.8 (1.4)	1.0	1.0
Yes (N=512)	43.7 (3.7)	56.3 (3.7)	10.0* (6.8–14.7)	6.4* (4.1–9.9)
8/10+ drinks^d				
No (N=873)	19.6 (2.3)	80.4 (2.3)	1.0	1.0
Yes (N=158)	59.9 (6.6)	40.1 (6.6)	6.1* (4.4–8.6)	2.7* (1.8–4.1)
Frequent heavy episodic drinking^e				
No (N=805)	18.6 (2.5)	81.4 (2.5)	1.0	1.0
Yes (N=226)	54.9 (5.6)	45.1 (5.6)	5.3* (3.9–7.3)	2.2* (1.5–3.3)

^a ORs and AORs calculated for the likelihood of experiencing any consequence (a fight, injury, or injury-related medical visit); AOR controls for age, sex, race/ethnicity, household income, number of brands consumed, and heavy episodic drinker status

^b Any OR or AOR where $p < .05$ is indicated by single asterisk

^c Heavy episodic drinking is defined for both males and females as consumption of five or more drinks in one sitting in the past 30 days

^d Respondents who reported consuming 8 or more drinks (for females) or 10 or more drinks (for males) in one sitting in the past 30 days

^e Frequent heavy episodic drinking is defined for both males and females as consumption of five or more drinks in one sitting, three or more times in the past 30 days

Table 2

Frequency of underage youth experiencing alcohol-related fights, injuries, and injury-related medical visits in the past year by demographics and self-reported drinking in the past 30 days

	Fight: % (SE)	Injury: % (SE)	Injury-related medical visit: % (SE)
Overall sample:	13.3 (1.9)	21.4 (2.2)	4.3 (1.0)
Age:			
13–15 (N=117)	10.4 (4.0)	14.4 (4.3)	6.0 (3.4)
16–18 (N=461)	11.3 (2.1)	17.5 (2.4)	3.3 (1.0)
19–20 (N=453)	15.3 (3.3)	25.7 (3.7)	4.7 (1.7)
Sex:			
Male (N=428)	17.0 (3.1)	20.3 (3.2)	4.4 (1.2)
Female (N=603)	9.4 (2.1)	22.6 (2.9)	4.2 (1.6)
Race/ethnicity:			
White (N=592)	11.4 (2.2)	19.8 (2.7)	3.1 (1.0)
Black (N=126)	21.8 (8.3)	18.5 (6.7)	6.2 (2.5)
Hispanic (N=214)	14.0 (4.5)	19.6 (4.6)	5.1 (3.1)
Other (N=99)	12.7 (4.3)	40.4 (8.7)	8.0 (3.4)
Income:			
<\$15,000 (N=235)	11.9 (3.0)	22.4 (4.4)	6.0 (1.9)
\$15,000–\$39,999 (N=270)	15.4 (4.4)	20.9 (4.6)	11.0 (4.3)
\$40,000–\$99,999 (N=365)	15.6 (3.3)	21.7 (3.4)	2.0 (0.7)
≥\$100,000 (N=161)	8.4 (4.0)	20.7 (5.0)	2.0 (1.1)
Heavy episodic drinking^a			
No (N=519)	1.7 (0.6)	6.2 (1.3)	1.7 (0.7)
Yes (N=512)	23.3 (3.3)	34.6 (3.6)	6.6 (1.8)
8/10+ drinks^b			
No (N=873)	9.8 (1.8)	15.9 (2.1)	3.3 (0.7)
Yes (N=158)	29.4 (6.6)	46.8 (6.8)	9.1 (4.4)
Frequent heavy episodic drinking^c			
No (N=805)	8.1 (1.9)	15.0 (2.2)	1.8 (0.5)
Yes (N=226)	31.2 (5.2)	43.6 (5.5)	12.9 (3.9)

^a Heavy episodic drinking is defined for both males and females as consumption of five or more drinks in one sitting in the past 30 days

^b Respondents who reported consuming 8 or more drinks (for females) or 10 or more drinks (for males) in one sitting in the past 30 days

^c Frequent heavy episodic drinking is defined for both males and females as consumption of five or more drinks in one sitting, three or more times in the past 30 days

Table 3

Top 25 alcohol brands consumed by underage youth experiencing an alcohol-related fight, injury, or injury-related medical visit in the past year: Overall consumption prevalence, prevalence during episodes of heavy episodic drinking, and overall market share

Top 25 alcohol brands	Overall consumption prevalence ^a (%)	Prevalence during episode of heavy episodic drinking ^b (%)	Overall market share, ^c (%)
Bud Light	35.0	22.3	4.9
Smirnoff Malt Beverages	26.7	12.7	2.7
Jack Daniels Whiskeys	26.6	21.2	1.8
Budweiser Beer	24.0	15.1	2.1
Smirnoff Vodkas	20.9	6.5	1.0
Coors Light	20.0	9.7	1.8
Absolut Vodkas	20.0	3.1	1.3
Captain Morgan Rums	19.3	11.1	1.2
Heineken	18.3	8.1	2.0
Bacardi Rums	18.1	10.0	1.3
Corona Extra	18.1	8.5	1.9
Bacardi Malt Beverages	15.7	5.1	0.8
Hennessy Cognacs	14.2	6.2	0.4
Mikes	13.7	9.4	2.2
Four Loko	13.5	8.3	0.8
Blue Moon	13.2	1.6	0.7
Jose Cuervo Tequilas	13.0	5.5	0.3
Patron Tequilas	12.7	6.2	0.4
Grey Goose Vodkas	12.6	6.7	2.0
Jack Daniels Cocktails	12.5	6.4	1.5
Miller Lite	12.1	4.9	2.6
Corona Extra Light	10.8	1.1	3.2
Everclear 190	10.5	2.6	0.7
Barefoot Wines	10.4	7.6	2.0
Ciroc Vodkas	10.3	4.4	0.3

^a Brand consumption prevalence was calculated for the 25 most-consumed brands among respondents reporting an alcohol-related fight, injury, or injury-related medical visit in the past year

^b Brand-specific consumption prevalence was determined for reported episodes of heavy episodic drinking—defined for both males and females as consumption of five or more drinks in one sitting in the past 30 days

^c Overall market share for each brand was calculated by taking the total number of drinks attributable to a brand in the past 30 days and then dividing by the total number of drinks for all brands included in the study

Table 4

Alcohol brand preferences of youth experiencing vs. not experiencing any alcohol-related fights, injuries, or injury-related medical visits in the past year

Alcohol brand	Consumption prevalence among those experiencing consequences ^a (%)	Consumption prevalence among those not experiencing consequences ^a (%)	Adjusted Odds Ratio (95% Confidence Interval) ^{b,c}
Bud Light	35.0	25.3	0.9 (0.6–1.3)
Smirnoff Malt Beverages	26.7	13.4	1.4 (0.9–2.2)
Jack Daniels Whiskeys	26.6	5.9	2.2* (1.3–3.6)
Budweiser Beer	24.0	11.2	1.0 (0.6–1.6)
Smirnoff Vodkas	20.9	9.7	1.3 (0.8–2.1)
Coors Light	20.0	10.0	0.7 (0.4–1.1)
Absolut Vodkas	20.0	6.5	2.5* (1.5–4.1)
Captain Morgan Rums	19.3	7.1	1.3 (0.8–2.1)
Heineken	18.3	6.6	1.8* (1.0–3.2)
Bacardi Rums	18.1	6.0	1.8* (1.1–3.1)
Corona Extra	18.1	8.8	0.9 (0.5–1.5)
Bacardi Malt Beverages	15.7	5.2	2.0* (1.1–3.5)
Hennessy Cognacs	14.2	2.5	4.8* (2.2–10.4)
Mikes	13.7	9.7	1.0 (0.6–1.7)
Four Loko	13.5	3.4	1.2 (0.6–2.5)
Blue Moon	13.2	6.3	1.0 (0.6–1.8)
Jose Cuervo Tequilas	13.0	6.2	1.0 (0.5–1.8)
Patron Tequilas	12.7	2.9	1.9 (1.0–3.8)
Grey Goose Vodkas	12.6	4.6	0.7 (0.4–1.4)
Jack Daniels Cocktails	12.5	1.5	3.7* (1.6–8.4)
Miller Lite	12.1	5.7	1.2 (0.7–2.2)
Corona Extra Light	10.8	3.2	1.8 (0.8–3.7)
Everclear 190	10.5	0.6	6.6* (2.1–20.8)
Barefoot Wines	10.4	2.2	1.9 (0.9–4.3)
Ciroc Vodkas	10.3	3.0	2.0 (1.0–4.3)

^a Brand consumption prevalence was calculated for the 25 most-consumed brands among respondents reporting an alcohol-related fight, injury, or injury-related medical visit in the past year

^b Adjusted odds ratios (AOR) controlled for sex, age, race/ethnicity, income, having 8 or more drinks (females) or 10 or more drinks (males) in one sitting, number of brands consumed, number of brands consumed during heavy episodic drinking (defined for both males and females as consumption of five or more drinks in one sitting in the past 30 days), and status as a frequent heavy episodic drinking (defined as three or more heavy episodic drinking episodes in the past 30 days)

^c Any AOR where $p < .05$ is indicated by a single asterisk