

Binge Drinking as a Risk Factor for Violence among Secondary School Students in a Nationally Representative Sample in Puerto Rico

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Objective: The objective of this study was to determine the association between binge drinking and violence in a representative sample of secondary-school students in Puerto Rico.

Methods: Consulta Juvenil VII (a biennial survey of school-aged youths in Puerto Rico) has a representative sample of adolescent students in Puerto Rico. A multi-stage stratified cluster sampling design was used. The sampling frame of Consulta Juvenil VII includes all the public and private schools registered with the Department of Education and the Council of General Education in Puerto Rico. The study utilizes a self-administered questionnaire that was translated and adapted from the “Student Survey of Risk and Protective Factors and Prevalence of Alcohol, Tobacco, and Other Drug Use”. “Binge drinking” was defined as having 5 or more alcoholic drinks in a row during the 30 days preceding the survey.

Results: Almost 20% of the sample members reported that at least 1 instance of binge drinking had taken place during the 2 weeks prior to the survey (17.7%). After controlling for gender, age, school level, the type of system, and the parents’ educational levels, the odds of a given binge drinker reporting violent behaviors were 5 times greater than the odds among non-binge drinkers (OR: 5.6; 95% CI: 4.7–6.7).

Conclusion: The study shows an association between binge drinking and violence in Puerto Rican adolescents, indicating that Hispanic youths who abuse alcohol may be at increased risk of violence. These findings suggest that violence prevention programs should be integrated with substance use prevention programs. [*PR Health Sci J* 2015;34:20-24]

Key words: Binge drinking, Violence, Students, Puerto Rico, Alcohol

Alcohol is the most commonly used psychoactive substance among young people (1). In the U.S., annual surveys such as the National Survey on Drug Use and Health (NSDUH) show that there is widespread use of alcohol among adolescents and young adults under the legal drinking age of 21. The 2009 NSDUH data disclosed that more than one half (52.2%) of the young people (aged 12 to 20 years) surveyed reported that they had consumed at least 1 alcoholic drink in their lifetimes; 44.6% had consumed alcohol in the past year, and 27.2% had consumed alcohol in the past month (2). In Puerto Rico, the Substance Abuse Needs Assessment Program estimated that 58.8% of 15- to 17-year-olds had drunk alcohol at least once in their lives (3).

Among alcohol users, binge drinking is a very common pattern of abuse, and it is responsible for the great majority of alcohol-related deaths (4). Binge drinking has been defined as consuming 5 or more consecutive drinks on the same occasion in the past 2 weeks for men, and 4 drinks or more for women (5,6). This pattern of alcohol use has been shown to be dangerous for all ages, and in the U.S., it has been shown to

be accountable for nearly 79,000 deaths each year (7). Binge drinking has been found to increase the risk of car accidents, violence, infection with HIV and sexually transmitted diseases, unwanted pregnancy, sudden infant death, and having a baby with fetal alcohol spectrum disorders (7). High rates of binge drinking are commonly found in adolescent studies. According to the CDC-sponsored Youth Risk Behavior Survey (2009), 24.2% of high school students reported having drunk 5 or more consecutive drinks during the last 30 days before the survey (8). In Puerto Rico, the rates of binge drinking among adolescents

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appear to be even higher. During the years 2005 through 2007, 54.9% of 12- to 17-year-olds reported binge drinking during the last 30 days before the survey (9).

Violent behaviors are also prevalent among adolescents and have an important impact on morbidity and mortality (9,10). In this study, violence was defined as acts involving serious harm or threats of harm to other persons. In 2007, the Youth Risk Behavior Survey reported that 36% of high school students were involved in fights and 19% admitted to having a gun (11). Several studies have found that a significant portion of violence among young people could be attributed to alcohol consumption, particularly to binge drinking (12, 13). Kodjo, Auinger, and Ryan (14) found that 11% of alcohol consumers reported that they were drinking when they had their most recent fight. Similarly, another study found that 1 out of 3 male alcohol drinkers and 1 out of 4 women drinkers had been involved in fights while drinking or because of drinking (15).

Although violence is one of the most costly consequences linked to alcohol use, there is a scarcity of information about the prevalence and risk factors for alcohol-related violent behavior. Specifically, the association of binge drinking and violent behaviors has not been adequately researched. Findings from the National Longitudinal Study of Adolescent Health show that binge drinking is a salient predictor of violent behavior initiation (16). Recent investigations have shown that there is a need for studies that can help disentangle the circumstances and the context that distinguish people who behave violently while drinking from those who do not (17). In this study, we examined the association of binge drinking and violence in a sample of adolescents surveyed in Puerto Rico.

Methods

The study data were collected as part of Consulta Juvenil, a biennial school survey that has been conducted in Puerto Rico since 1990. The sample of Consulta Juvenil is representative of adolescents attending all public and private, middle and high schools in Puerto Rico. The sampling scheme designed for Consulta Juvenil is a multi-stage stratified cluster sampling. Weights are calculated based on the probability of selection, and post-stratification weights are adjusted for non-participation. The data used in this study were collected in the survey conducted during the 2005 through 07 academic years. In this survey wave, 13,208 students were selected for participation, and 10,235 completed the questionnaire, for an overall participation rate of 76.9%.

The study utilized a self-administered questionnaire that included questions from the SAMHSA-sponsored "Student Survey of Risk and Protective Factors and Prevalence of Alcohol, Tobacco, and Other Drug Use" (18–20). In this study, an individual's measure of violent behavior was calculated based on the number of "yes" responses received for the following 5

questions: In the past 12 months have you 1) hurt someone badly enough that he or she required medical treatment; 2) carried a gun; 3) carried any kind of weapon while on school property; 4) hit a teacher; 5) been or are you now a member of a gang? "Binge drinking" was defined as having 5 or more alcoholic drinks in a row during the 30 days preceding the survey

For each survey wave, parents were informed of the study objectives and activities and asked to provide written consent. Adolescents were also asked to assent to participate. All study activities, protocols, and the informed consent and assent forms were reviewed and approved by the Institutional Review Board of the Universidad Central del Caribe School of Medicine.

Statistical analysis

Frequency distributions and descriptive statistics were used to describe the study sample. Bivariate analyses employing chi-square tests of independence were used to examine the association between youth violence, sociodemographic characteristics, and binge drinking. A multiple logistic regression model was fitted to assess the effects of binge drinking on youth violence after adjusting for sociodemographics and other covariates of interest. All the statistical analyses were performed using SPSS version 17 (2008) and STATA version 10 (2007).

Results

Table 1 shows a profile of the study sample. The participants included 6,552 males (47.9%) and 7,120 females (52.1%). The sample was evenly divided between adolescents in middle school (grades 7 through 9, 51.6%) and those in high school (grades 10 through 12, 48.4%). The majority of the sample was recruited from the public school system (70.3%). Two thirds of the adolescents reported that their mothers had more than a high school education and 54% reported the same of their fathers. Almost 18% of the sample members reported at least 1 instance of binge drinking during the prior 2 weeks (17.7%).

Table 2 shows the results of the bivariate analysis. Males, adolescents 14 years old or older, adolescents attending private schools, and those who reported recent binge drinking were more likely to report violent behaviors. Parents' educational levels did not reach statistical significance.

Table 3 shows the results of the logistic multivariate regression analysis. After controlling for gender, age, school level (middle versus high school), the type of system (private versus public), and the parents' educational levels, the odds of a given binge drinker reporting violent behaviors were 5 times greater than the odds among non-binge drinkers (OR: 5.6; 95% CI: 4.7–6.7).

Discussion

This study shows a binge-drinking prevalence of 17.7% in Puerto Rican adolescents, which is similar to published estimates

coming from studies conducted in the U.S. According to the Substance Abuse and Mental Health Services Administration (2), of the total of 10.8 million underage Americans (12–20 years) who reported consuming alcohol in the past 30 days, 7.2 million (or 19%) had engaged in binge drinking.

Table 1. Sociodemographic characteristics of the study sample

	n	(%)
<i>Gender</i>		
female	7,120	52.1
male	6,552	47.9
<i>Age</i>		
13 years or under	4,484	32.8
14–15 years	4,531	33.1
16 years or more	4,668	34.1
<i>School level</i>		
middle	7,090	51.6
high	6,640	48.4
<i>Type of system</i>		
public	9,652	70.3
private	4,078	29.7
<i>Mother's education</i>		
less than high school	976	8.7
high school	2,814	25.0
more than high school	7,482	66.4
<i>Father's education</i>		
less than high school	1,390	13.5
high school	3,361	32.6
more than high school	5,567	54.0

Table 2. Sociodemographic characteristics, Binge drinking, and Violent behavior

Variables	Violent behavior %	POR*	95% CI**
<i>Gender</i>			
female	3.3	1.0	
male	10.0	3.2	2.8–3.8†
<i>Age</i>			
13 years or under	4.8	1.0	
14–15	7.7	1.6	1.1–1.8†
16 years or more	7.2	1.5	1.0–1.7
<i>School level</i>			
middle	6.0	1.0	
high	7.2	1.2	1.1–1.4†
<i>Type of system</i>			
public	1.3	1.0	
private	7.3	1.2	1.0–1.4
<i>Mother's education</i>			
less than high school	6.1	1.0	
high school	6.4	0.9	0.8–1.1
more than high school	6.6	1.0	0.9–1.1
<i>Father's education</i>			
less than high school	8.1	1.0	
high school	5.9	0.8	0.7–1.0
more than high school	6.5	0.9	0.8–1.1
<i>Binge drinking</i>			
no	3.9	1.0	
yes	18.4	5.6	4.8–6.6†

*Prevalence Odds Ratio (POR), **95% Confidence Interval, †p<0.05

In our findings, the prevalence of binge drinking among males was higher than the prevalence among females. Several studies have shown that violent behavior is less socially acceptable for females than for males, which probably explains why, as is the case in many studies, males have been found to be more violent than females (21,22). A study of Brazilian adolescents examined the association between bullying and drug/alcohol use and physical violence. In the study, the prevalence of physical violence was significantly higher in boys (17.5%) than in girls (8.2%) (22). The authors of the study found there to be a significant association between physical violence and being a victim of bullying with alcohol consumption in boys.

Table 3. Adjusted prevalence odds ratios for violence

Variables	AOR*	95% CI**
<i>Gender</i>		
female	1.0	
male	2.9	2.4–3.4†
<i>Age</i>		
13 years or under	1.0	
14–15	1.4	1.1–1.7†
16 years or more	1.1	0.8–1.5
<i>School level</i>		
middle	1.0	
high	0.8	0.6–1.1
<i>Type of system</i>		
public	1.0	
private	1.1	0.9–1.3
<i>Mother's education</i>		
less than high school	1.0	
high school	1.2	0.9–1.6
more than high school	1.2	0.9–1.4
<i>Father's education</i>		
less than high school	1.0	
high school	0.8	0.6–1.0
more than high school	0.8	0.6–1.1
<i>Binge drinking</i>		
no	1.0	
yes	5.6	4.7–6.7†

*Adjusted Odds Ratio, **95% Confidence Interval, †p<0.05

Some limitations should be considered when interpreting the results of this investigation. First, this study followed a cross-sectional design. This design limits the inferences that can be made with respect to causality because of the difficulty of formulating a temporal relationship. Second, the information about binge drinking and violent behaviors was self-reported and, thus, subject to recall bias and denial. However, self-reported data have been used in most studies on the epidemiology of binge drinking and violent behaviors and have proven to be reliable and valid (23).

The results of this study point out the need for the continued monitoring of health-risk behaviors among high school students in Puerto Rico. According to the report “Reducing Underage Drinking: A Collective Responsibility” from the Institute of Medicine of the National Academy of Sciences (24), underage

drinking cannot be successfully addressed by focusing on young people alone; efforts to reduce underage drinking need to focus on adults and must engage society at large. However, many studies of the predictors of alcohol and other drug misuse by adolescents have indicated that an early age of initiation is an important precursor to later misuse (25–27). Therefore, we recommend community-based programs and interventions that incorporate elements known to be effective in preventing youth drinking and excessive drinking practices or, at least, in delaying the age of initiation. Interventions that combine multiple learning and training techniques and that include teacher training, parent education, and social competence training for young, elementary-aged children have been shown to be effective in lowering the rates of health-risk behaviors, such as delinquency and heavy drinking, among others (28). The present study shows an association between binge drinking and violence in Puerto Rican adolescents, indicating that Hispanic youths who abuse alcohol may be at an increased risk for violence. These findings suggest that violence prevention programs should be integrated with substance use prevention programs. The etiologies of substance use, violence, and delinquency are very similar; therefore, it is suggested that these behaviors may be targeted by a single intervention strategy (29). In addition, violence prevention programs for youths need to focus on strategies that reduce involvement in physical fighting and discourage weapon carrying on school property. Other prevention programs tailored for adolescents that focus on violence and the media, anger management, and conflict resolution skills may be effective in the reduction of these acts of violence and delinquency (29).

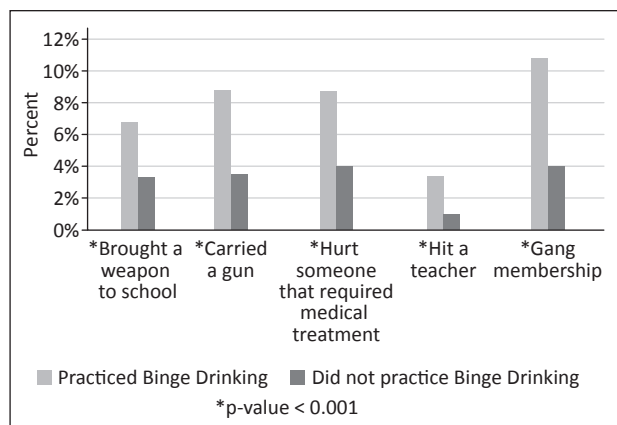


Figure 1. Percent of violent behavior by type of violent behavior in adolescents who practice/did not practice binge drinking during past month

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Resumen

Objetivo: El objetivo de este estudio fue determinar la asociación entre el consumo excesivo de alcohol y la violencia en una muestra representativa de estudiantes adolescentes en Puerto Rico. **Metodología:** Consulta Juvenil VII (una encuesta bianual de jóvenes en edad escolar en Puerto Rico) incluye una muestra representativa de estudiantes adolescentes en Puerto Rico. El diseño de la muestra fue un muestreo de múltiples etapas estratificado por conglomerados. El marco muestral de Consulta Juvenil VII incluye todas las escuelas públicas y privadas registradas en el Departamento de Educación y el Consejo General de Educación de Puerto Rico. El estudio utiliza un cuestionario auto-administrado que fue traducido y adaptado del “Student Survey of Risk and Protective Factors and Prevalence of Alcohol, Tobacco, and Other Drug Use”. El consumo excesivo de alcohol se definió como ingerir cinco o más tragos de alcohol seguidos durante los 30 días previos a la encuesta. **Resultados:** Casi el 20% de la muestra informó consumir alcohol en exceso al menos una vez durante las dos semanas previas a la encuesta. Luego de controlar por género, edad, nivel educativo, tipo de sistema y educación de los padres, se observó que el riesgo de llevar a cabo conductas violentas fue cinco veces mayor entre los adolescentes que consumían alcohol en exceso en comparación con aquellos que no consumían. **Conclusión:** El estudio muestra una asociación entre el consumo excesivo de alcohol y la violencia entre los adolescentes en Puerto Rico, lo que indica que los jóvenes hispanos que abusan del alcohol pueden tener un mayor riesgo de violencia. Estos hallazgos sugieren que los programas de prevención de la violencia deben ser integrados en los programas de prevención del consumo de sustancias.

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