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ORIGINAL ARTICLE

Alcohol consumption and violence among Argentine adolescents☆

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Abstract

Objective: This study investigated the association between alcohol and violence among Argentine youth.
Methods: Data from the 2007 Argentina Global School-based Student Health Survey (GSHS), a nationally representative survey of middle school students, were examined using age-adjusted logistic regression models.
Results: Of the 1,328 participating students aged 13 to 15 years old, 51.9% reported drinking alcohol in the previous month, with higher rates among males ($p = 0.04$) and older students ($p < 0.01$). Both male and female drinkers were nearly twice as likely as non-drinkers to report being physically attacked, being in a physical fight, and having thoughts about self-directed violence. Among drinkers, those who reported poor mental health, were victims of bullying, used tobacco or drugs, or skipped school without permission were approximately twice as likely as other drinkers to have engaged in violent activities.
Conclusion: Public health interventions targeting violence among young adolescents should be developed in combination with alcohol education programs.

PALAVRAS-CHAVE
Consumo de álcool;
Estudo transversal;
Adolescente;
Fator de risco;
Violência;
Argentina

Consumo de álcool e violência entre adolescentes argentinos

Resumo

Objetivo: Este estudo investigou a associação entre álcool e violência na população de jovens argentinos.
Métodos: Dados da *Global School-based Student Health Survey* (GSHS) de 2007, uma pesquisa representativa em termos nacionais com alunos do ensino médio, foram examinados utilizando-se modelos de regressão logística ajustados por idade.

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Resultados: Dos 1328 alunos participantes entre 13 e 15 anos de idade, 51,9% declararam ter consumido álcool no último mês, com taxas mais elevadas entre meninos (p = 0,04) e alunos mais velhos (p < 0,01). Homens e mulheres que bebem demonstraram estar quase duas vezes mais propensos a relatar agressão física, quando em uma briga física, e pensamentos sobre violência autoinfligida do que aqueles que não bebem. Entre as pessoas que bebem, aquelas que reportaram saúde mental precária, haviam sido vítimas de *bullying*, fumavam, faziam uso de drogas ou abandonaram a escola sem permissão se mostraram duas vezes mais propensas ao envolvimento em atividades violentas do que outras pessoas que também bebem.
Conclusão: Intervenções de saúde pública quanto à violência entre jovens adolescentes devem ser desenvolvidas em combinação com programas de educação sobre álcool.

Introduction

Alcohol consumption among adolescents represents a major global public health concern due to its immediate and long-term physical and mental health effects. Several previous studies have found an association between alcohol consumption and violent behaviors,[1-6] but this was the first study to use the Global School-based Student Health Survey (GSHS) to examine the association between alcohol consumption and three types of violence among middle school students.

The GSHS, sponsored by the World Health Organization (WHO) and the U.S. Centers for Disease Control and Prevention (CDC) in collaboration with participating countries, investigates the health and risk behaviors of middle school students living in low- and middle-income countries across the world. GSHS results are used by participating countries to identify public health policies and interventions that might significantly enhance the health of adolescents aged 13 to 15 years.

One of the strengths of the GSHS is that its surveillance methods and survey questions are standardized for all participating countries, allowing for the comparison of the prevalence of risk behaviors and health practices across countries. Each country's questionnaire includes a set of core modules on demographics, diet, alcohol use, personal hygiene, tobacco and drug use, sexual behaviors, physical activity, mental health, injuries, and other risk and protective factors.[7] Countries have the option of adding an expanded set of core questions or their own country-specific questions to this common set of questions.

Ministries of Health or Education (or other governmental agencies) in participating countries are responsible for data collection, and these agencies have exclusive rights to the data for the first two years after collection.[8] After this period, the data are made freely accessible to the public. Data can be downloaded for analysis from the CDC and WHO websites.

To date, approximately 100 countries have participated in the GSHS or are in the process of implementing their first survey. Participating countries have the option of conducting a survey with a national sample of students or selecting only some parts of the country for inclusion. Thus far, eight South American countries have participated in the GSHS. Four of these countries — Chile, Colombia, Ecuador, and Venezuela — collected information only from one or more metropolitan areas. Four countries — Argentina, Guyana, Peru, and Uruguay — conducted national surveys. The first Argentine GSHS was conducted in November and December of 2007.[9]

This study aimed to identify the prevalence of alcohol drinking among Argentine adolescents, to examine the association between drinking and both other-directed and self-directed violence, and to identify gender-specific predictors of violence among drinkers.

Methods

All countries participating in the GSHS follow a standard protocol. The GSHS methodology and question bank were reviewed by research ethics experts and approved by the WHO and the CDC. Additionally, the national government of each participating country reviews and approves the protocol and questionnaire prior to the initiation of data collection. Argentina's GSHS was approved by its Ministries of Health and Education.

To ensure the recruitment of a representative sample of middle school students, a two-stage cluster sampling technique was used. In Argentina, 50 schools were randomly selected (using a probability proportional to size approach) from a list of all public and private schools across the country, of which 47 (94%) agreed to participate.[10] Then, within each of the sampled schools, one or more classes in which the majority of students were between 13 and 15 years old were randomly selected to participate in the study.

Students enrolled in the sampled classes were invited to complete an anonymous self-report questionnaire during school hours. Of the 2,414 sampled students from the 47 participating schools, 1,980 (82%) completed the GSHS. The overall participation rate across all 50 schools was 77%.[10] This sample size met the GSHS' study guidelines, which require statistical power sufficient to estimate prevalence rates with an accuracy of ±5% or better.[10]

Table 1 Demographic, environmental, and psychological characteristics associated with alcohol consumption among adolescents aged 13 to 15 years in Argentina.

	Time unit	Gender	Total % reporting characteristic	p-value for χ^2 test of difference of prevalence by gender	% of drinkers (n = 689)	% of non-drinkers (n = 639)	Age-adjusted OR and 95% CI
Experience of violence							
Was in a physical fight one or more times	Past year	Female	16.4%	< 0.001	22.5%	10.5%	2.35 (1.53, 3.60)
		Male	41.9%		50.4%	31.5%	2.32 (1.63, 3.31)
Was physically attacked one or more times	Past year	Female	18.7%	< 0.001	23.6%	13.9%	1.96 (1.32, 2.91)
		Male	32.3%		38.9%	24.5%	2.19 (1.50, 3.20)
Seriously considered attempting suicide	Past year	Female	18.9%	0.003	26.5%	11.6%	2.61 (1.73, 3.92)
		Male	12.8%		16.2%	8.8%	1.85 (1.08, 3.16)
Mental health status							
Felt lonely sometimes, most of the time, or always	Past year	Female	44.0%	< 0.001	52.7%	35.6%	1.84 (1.35, 2.51)
		Male	25.5%		27.9%	22.5%	1.38 (0.93, 2.04)
Felt so sad or hopeless almost every day for two weeks or more in a row that the student stopped doing usual activities	Past year	Female	34.4%	< 0.001	40.1%	28.8%	1.50 (1.09, 2.08)
		Male	22.9%		23.9%	21.7%	1.11 (0.74, 1.67)
Was so worried most of the time or always that the student could not sleep	Past year	Female	41.6%	< 0.001	53.1%	30.4%	2.64 (1.92, 3.61)
		Male	29.7%		34.8%	23.6%	1.64 (1.13, 2.40)
Substance abuse							
Smoked one or more cigarettes	Past month	Female	21.5%	0.884	37.3%	6.7%	7.18 (4.46, 11.55)
		Male	21.2%		34.4%	5.6%	7.96 (4.42, 14.32)
Used drugs at least once	Lifetime	Female	6.1%	< 0.001	10.9%	1.4%	8.47 (3.26, 22.02)
		Male	11.9%		18.1%	4.4%	4.31 (2.22, 8.38)
Parental involvement							
Parents never/rarely checked homework	Past month	Female	44.5%	0.002	51.6%	37.6%	1.72 (1.26, 2.33)
		Male	36.1%		42.2%	28.9%	1.65 (1.15, 2.37)
Parents never/rarely knew about free time activities	Past month	Female	25.3%	0.383	32.1%	18.6%	2.09 (1.45, 3.00)
		Male	27.4%		33.0%	20.7%	1.84 (1.24, 2.74)
Felt understood by parents rarely or never	Past month	Female	29.7%	0.304	35.5%	24.1%	1.66 (1.18, 2.33)
		Male	27.1%		30.0%	23.5%	1.23 (0.83, 1.83)
Other exposures							
Missed school without permission for two or more days	Past month	Female	12.6%	0.805	18.7%	6.7%	2.95 (1.78, 4.88)
		Male	13.1%		18.6%	6.5%	3.16 (1.78, 5.61)
Was physically active for at least 60 minutes two days or fewer	Usual week	Female	70.0%	< 0.001	70.0%	70.0%	0.98 (0.71, 1.37)
		Male	52.3%		48.8%	56.5%	0.78 (0.55, 1.11)

Continuation Table 1

	Time unit	Gender	Total % reporting characteristic	p-value for χ^2 test of difference of prevalence by gender	% of drinkers (n = 689)	% of non-drinkers (n = 639)	Age-adjusted OR and 95% CI
Was hungry sometimes, most of the time, or always	Past month	Female	11.7%	0.226	14.7%	8.9%	1.96 (1.21, 3.17)
		Male	13.9%		12.5%	15.6%	0.80 (0.49, 1.30)
Did not have any good friend	Current	Female	4.2%	0.644	3.5%	4.8%	0.67 (0.31, 1.45)
		Male	4.7%		3.3%	6.3%	0.59 (0.26, 1.33)
Was bullied one time or more in the past month	Past month	Female	24.0%	0.326	29.6%	18.6%	1.90 (1.32, 2.75)
		Male	26.4%		29.3%	22.9%	1.51 (1.01, 2.26)

95% CI, confidence interval; OR, odds ratio.

Table 2 Age-adjusted odds ratios for the association between environmental and psychological predictors and various types of violence among male and female drinkers.

	Was physically attacked		Was involved in a physical fight		Had thoughts of self-violence	
	Female drinkers	Male drinkers	Female drinkers	Male drinkers	Female drinkers	Male drinkers
Felt lonely	2.46 (1.45, 4.19)	2.41 (1.47, 3.94)	1.70 (1.01, 2.85)	1.05 (0.65, 1.70)	3.03 (1.80, 5.09)	5.44 (2.94, 10.09)
Felt sad or hopeless	2.96 (1.77, 4.95)	2.48 (1.48, 4.17)	2.21 (1.32, 3.70)	1.64 (0.98, 2.74)	5.97 (3.51, 10.13)	3.10 (1.67, 5.74)
Could not sleep	2.49 (1.46, 4.23)	2.15 (1.35, 3.41)	1.53 (0.91, 2.55)	1.68 (1.06, 2.64)	2.48 (1.50, 4.11)	3.49 (1.92, 6.37)
Smoked	1.80 (1.07, 3.05)	2.77 (1.71, 4.48)	2.00 (1.17, 3.41)	2.60 (1.60, 4.22)	2.13 (1.28, 3.54)	2.83 (1.54, 5.22)
Used drugs	2.02 (0.97, 4.21)	1.90 (1.07, 3.36)	3.44 (1.70, 6.94)	2.05 (1.14, 3.69)	2.65 (1.31, 5.34)	4.40 (2.29, 8.47)
Parents did not check homework	1.63 (1.10, 2.40)	1.50 (1.05, 2.14)	1.70 (1.13, 2.56)	1.29 (0.92, 1.82)	2.82 (1.90, 4.19)	1.64 (1.00, 2.69)
Parents did not know about free time	1.73 (1.34, 2.63)	1.38 (0.94, 2.02)	1.82 (1.18, 2.80)	1.91 (1.32, 2.76)	3.37 (2.25, 5.04)	2.90 (1.76, 4.78)
Did not feel understood by parents	1.54 (1.02, 2.32)	1.43 (0.98, 2.11)	1.60 (1.05, 2.45)	1.54 (1.07, 2.23)	2.78 (1.87, 4.14)	2.99 (1.82, 4.92)
Missed school without permission	2.62 (1.46, 4.71)	1.25 (0.71, 2.20)	1.70 (0.93, 3.12)	1.45 (0.82, 2.57)	1.95 (1.09, 3.49)	2.18 (1.12, 4.26)
Was bullied	2.19 (1.27, 3.76)	2.49 (1.51, 4.12)	1.76 (1.01, 3.06)	1.68 (1.03, 2.76)	2.25 (1.34, 3.77)	4.11 (2.21, 7.65)

This analysis focuses exclusively on the 1,512 participant students aged 13 to 15 years old, since the GSHS survey is designed and validated for this age group. 184 participants were excluded from the analysis because they did not answer the questions about gender (n = 14) or alcohol use (n = 170). Thus, the final study population comprised 1,328 students.

All variables were re-coded on a dichotomous scale. Students were considered to be drinkers if they had consumed one or more alcoholic beverage in the previous month. Violence was measured with three questions about the previous year: the first about being the victim of violence (being physically attacked), the second regarding instigating or participating in violence against others (being in a physical fight), and the third about self-directed violence (whether the student had seriously considered suicide).

Additional variables were used to further investigate the association between alcohol consumption and violence. Three mental health questions regarded loneliness, insomnia-producing anxiety, and extended sadness or hopelessness during the previous year. Use of other substances was assessed with questions about smoking cigarettes in the previous month or using other drugs at least once during the lifetime. Three parental involvement questions asked whether in the previous month the students considered that their parents checked their homework, knew how they spent their free time, and understood their problems at least some of the time (rather than rarely or never). Other questions asked about skipping school twice or more in the previous month, engaging in an hour of physical activity on less than two days in the past week, being hungry at least sometimes during the previous month due to lack of food in the home, having no close friend, and being the victim of a bully in the previous month.

Chi-squared tests were used to compare the responses to questions by drinkers and non-drinkers. The maximum likelihood estimate odds ratio (OR) and its 95% confidence interval (CI) were used to examine the associations between alcohol consumption and various types of violence, and to examine the predictors of violence among drinkers. Age-adjusted ORs were calculated for males and females using multiple logistic regression models; each model included drinking or one of the forms of violence as the outcome variable of interest and one of the behavioral or psychological predictors and age as predictor variables. The Breslow-Day test for homogeneity of the stratum-specific ORs was used to test whether the associations between alcohol consumption and individual risk factors were different for males and females. Analyses were performed using the Statistical Package for Social Sciences (SPSS) version 19. P-values lower than 0.05 were considered to be statistically significant.

Results

Over half (51.9%) of all participants reported consuming alcohol in the previous month, including 55.0% of males and 49.2% of females. Since more males than females were drinkers ($p = 0.04$) and consumption of alcoholic beverages increased with age (from 29.7% of 13-year-olds to 51.3% of 14-year-olds and 65.7% of 15-year-olds [$p < 0.01$]), further analyses were conducted separately for males and females and were adjusted for age. Drinkers were significantly more likely than non-drinkers to report poor mental health, use of tobacco and drugs, low parental involvement in their lives, skipping school, and peer victimization as the target of a bully (Table 1). Poor mental health appeared to be more strongly associated with alcohol consumption among females than males. However, the Breslow-Day test for homogeneity of the strata demonstrated that only the association between hunger and drinking was significantly different for males and females ($p = 0.01$).

Both female and male drinkers were significantly more likely to engage in each of the three forms of violence examined than their non-drinking classmates. Because of the excess risk of violence among drinkers, additional tests were run to identify predictors of violence among drinkers. Several psychological and behavioral characteristics were found to be predictors of all three types of violence among drinkers, including symptoms of depression, anxiety, cigarette smoking, drug use, skipping school, and peer victimization (Table 2). The Breslow-Day tests did not identify any statistically significant differences between males and females.

Discussion

The prevalence of alcohol consumption among young Argentine adolescents is quite high, and is significantly associated with both active and passive violence. Several behavioral and environmental characteristics evaluated in this study were associated with an increased risk of drinking and also with an increased risk of violence by those who consume alcohol. Males and females shared similar risk factor profiles for alcohol consumption and for engagement in violence by drinkers.

Alcohol use among adolescents in the Americas varies widely by country, from approximately 15% to 51%.[11] Frequent alcohol consumption and binge drinking are both reported to be common among secondary school students in South America.[4,12-16] This new analysis supports previous findings that the drinking rate in Argentina tends to be comparatively high.[11,12] This is of particular concern because early initiation of alcohol use is associated with an increased risk of alcoholism in adults.[16-18] The age at first drink and the regular consumption of alcoholic beverages during adolescence are strongly influenced by social, economic, and environmental factors, including those identified in this analysis.[19]

Alcohol use by teenagers is also associated with peer/dating violence and with suicide attempts.[3,5,6] The majority of the studies available in the literature did not concomitantly evaluate multiple forms of violent behavior, while the present study is based on a more comprehensive approach of risk factors and evaluation of both active and passive violence. In addition, little is

known about the association between alcohol consumption and violent behaviors in middle school students living in South American countries, since the vast majority of the studies evaluating this association have targeted European and North American youth.

Public health interventions to discourage youth alcohol consumption would help to counteract other pressures on teenagers, including the influences of teenage-targeted marketing by brewing companies.[8,12] Several different approaches to improve the success of youth anti-alcohol efforts were found to be successful. Restricting exposure to alcohol advertising may be helpful for postponing initiation of drinking and for reducing binge drinking.[20] Programs that alert parents to the dangers of youth drinking and provide parenting tips may be critical for the success of anti-drinking campaigns, since interventions that give parents tools for talking with their children about alcohol were found to be more effective than youth alcohol education alone.[21,22] School-based and healthcare facility-based programs may also be helpful in reducing both alcohol use and violence. For example, school and emergency room programs that teach cognitive-behavioral decision-making, communication, peer relationship, and stress management techniques to adolescents have led to significant reductions in alcohol consumption and violence.[23,24] Addressing mental health issues, peer relationships, and use of other substances — all factors associated with violence among drinkers in the Argentine GSHS — may also help to reduce the rate of violence among those students who drink.

This study had several strengths, including a nationally representative sample and relatively high participation rate. However, two key limitations must be acknowledged. First, the cross-sectional study design and the different time scales (week, month, year) used for the exposure variables preclude evaluations of causality. Alcohol use may lead to violence, but it is equally possible that students who engage in violence with others or are considering self-directed violence are more likely to seek alcohol. Second, the GSHS is a self-administered survey, so some students may have misreported their behaviors and perceptions. Student responses were not validated by direct observation or supplementary parental or school data. Even with these limitations, it is clear from this study that alcohol use by Argentine middle school students and the increase in violence associated with alcohol consumption are both areas of concern.

Conflicts of interest

The authors have no conflicts of interest to declare.

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