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# Factors associated with heavy alcohol use among students in Brazilian capitals

## ABSTRACT

**OBJECTIVE:** To evaluate the association between heavy use of alcohol among students and family, personal and social factors.

**METHODS:** Cross-sectional study including public school students aged 10 to 18 from 27 Brazilian capital cities in 2004. Data was collected using an anonymous, self-report questionnaire that was adapted from a World Health Organization instrument. A representative sample comprising 48,155 students was stratified by census tracts and clusters (schools). The associations between heavy alcohol use and the factors studied were analyzed using logistic regression at a 5% significance level.

**RESULTS:** Of all students, 4,286 (8.9%) reported heavy alcohol use in the month prior to the interview. The logistic regression analysis showed an association between fair or poor relationship with the father (OR = 1.46) and the mother (OR = 1.61) and heavy use of alcohol. Following a religion (OR = 0.83) was inversely associated with heavy alcohol consumption. Sports practice and mother perceived as a "liberal" person had no significance in the model. However, a higher prevalence of heavy use of alcohol was seen among working students.

**CONCLUSIONS:** Stronger family ties and religion may help preventing alcohol abuse among students.

**DESCRIPTORS: Students. Alcohol Drinking. Family Characteristics. Socioeconomic Factors. Cross-Sectional Studies.**

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## INTRODUCTION

The first exposure to alcohol often occurs during childhood and adolescence, the latter being a life phase marked by social and psychological vulnerability. It is characterized by search for new experiences, along with impulsive behaviors, anxiety, insecurity, dissatisfaction and aggression.[4] Alcohol use meets all the requirements for the disharmony in adolescence: immediate pleasure; transgression; escape through solitary pleasure; playing with death; need for power; nonconformity; need for freedom, acceptance and respect from peers/friends.[3]

While most teenagers try alcohol, a small proportion may develop abuse with serious consequences for their future life.[21] Studies have showed that early use of alcohol is one of the main factors for heavy drinking in the future.[27] In Brazil, although prohibited by law, young people can easily obtain alcohol, which has wide cultural acceptance across all socioeconomic classes.[19]

Besides adolescents' vulnerability and easy access to alcohol, other associated factors have been studied, such as family relationships. Studies have reported that increased use of substances by children is associated with parents who have little control over them, or do not care about their habits, as well as with lack of communication between parents and children. Personal and social factors such as not practicing a religion, low compliance with school activities, and pressure from peers who use drugs are also concurrent with substance abuse.[9]

Other factors such as work and sports may be associated with the use or non-use of substances. Adolescents who work are more prone to substance use. Some authors suggest that this behavior is due to contact with adults in the workplace, stress, low school commitment, and increased income, all of which allow greater substance use and early transition to adult roles.[24]

Although sports are associated with healthy behaviors, evidence points to a controversy when it comes to alcohol. Some studies indicate sports as a protective factor, while others found no association. Most of them, however, show a positive correlation between alcohol and sports.[16]

Therefore, having a better understanding of factors associated with substance use among adolescents can be a valuable input for researchers to design preventive actions and interventions on these behaviors.[23] Since alcohol consumption is socially accepted, its use needs to be further explored among young people to prevent a potential progression to abuse.

The objective of the present study was to evaluate heavy use of alcohol among students and its association with family, personal and social factors.

## METHODS

A cross-sectional study was conducted among students aged ten to 18 years from public elementary and high schools in all Brazilian capitals. A representative sample was stratified by census tracts in each city and their related socioeconomic characteristics, as well as by clusters corresponding to the schools selected. Random selection was carried out in two stages: first by school, and then by classroom, as proposed by Kish.[12]

Data were collected through an anonymous self-administered questionnaire with closed questions, adapted from an instrument of the World Health Organization (WHO).[22] The instrument was applied between April and June 2004. The questionnaire was administered to all students in the classroom, in the absence of the teacher to reduce bias towards underreporting. Each classroom was visited only once when researchers, who had been properly trained, explained the objectives of the study to students. To ensure anonymity, students were asked to drop their questionnaires inside a box after completion. The questionnaire comprised questions about frequency and pattern of substance use; demographic data; school attendance; sports; religion and work. In addition, there were questions about family relationships and perception of parental control. The instrument had a socioeconomic scale developed by the Brazilian Association of Market Research Institutes. In order to increase the reliability of responses, we included a question on the use of a fictitious drug in the questionnaire.

We adopted some procedures to detect and correct typing errors, e.g. answers with impossible values. In addition, a subsample comprising 10% of subjects in each city was drawn for a full check of the questionnaire. Typing errors accounted for less than 2% of all 2,166,975 pieces of data entered. Since each question consisted of several items, it allowed us to test internal consistency. For example, if a student checked "use over the year" but not "lifetime use," it was considered an inconsistency and the data was excluded.

Questionnaires with typing errors were corrected and inconsistencies were manually reviewed. Those questionnaires with a "yes" answer to the question on the fictitious drug or with more than three cancelled questions or blank answers were excluded from the sample. The final sample included 48,155 students as shown in Table 1.

Heavy alcohol users were those students who consumed alcohol for 20 days or more in the last month or had at least six episodes of alcohol intoxication during the same period. Out of the total sample, 4,286 students (8.9%) were classified as heavy alcohol users.

**Table 1.** Sociodemographic characteristics of students in public elementary and high schools. Brazilian capitals, 2004. (N= 48,155)

| Variable | n | % |
|---|---|---|
| Gender | | |
| Male | 21,141 | 43.9 |
| Female | 24,463 | 50.8 |
| Not available | 2,551 | 5.3 |
| Age (years) | | |
| 10–12 | 13,041 | 27.1 |
| 13–15 | 17,494 | 36.3 |
| 16–18 | 9,772 | 20.3 |
| >18 | 3,628 | 7.5 |
| Not available | 4,220 | 8.8 |
| Schooling | | |
| Middle school | 34,482 | 71.6 |
| High school | 13,673 | 28.4 |
| School delay (years) | | |
| None | 21,828 | 45.3 |
| 1–2 | 14,475 | 30.1 |
| ≥3 | 7,632 | 15.8 |
| Not available | 4,220 | 8.8 |
| Socioeconomic status | | |
| A | 1,380 | 2.9 |
| B | 8,798 | 18.3 |
| C | 20,036 | 41.6 |
| D | 12,158 | 25.2 |
| E | 3,854 | 8.0 |
| Not available | 1,929 | 4.0 |

We applied weights to the distribution in the sample, allowing expansion of data to the target population. The expansion fraction is calculated by dividing the total number of classrooms by the number of schools in the sample, assuming that each student has an equal probability of being included in the sample.[12]

The study database was divided into two parts: one with 70% of the records (development database) used for estimating the logistic regression parameters, and the other one with the remaining 30%, used to validate the model (validation database). The validation consisted of a statistical assessment of the difference between the receiver operating characteristic (ROC) curve estimates of the two sub-samples.

First, as a preliminary analysis, we performed the bivariate analysis at the level of significance of 20% in order to separate the variables that would be modeled by logistic regression, for which we considered a level of significance of 5%. All procedures for logistic regression

and validation of the model followed the guidelines proposed by Hosmer & Lemeshow.[10] The variables of interest included: gender; age; relationship with the father and the mother; relationship between parents; perception of parental control; school delay; religion; sports; and work. For the analyses we used the public domain software R (R Project for Statistical Computing).

Subjects were informed their participation in this study was voluntary and that they were free to withdraw their participation at any time or leave questions unanswered. The informed consent form was signed only by the schools' principals. The Research Ethics Committee of *Universidade Federal de São Paulo* approved the study (0718/03).

**RESULTS**

In the bivariate analysis, all variables were significant at 80% confidence interval.

Table 2 presents the results from the final logistic regression model (p-values, odds ratios and confidence interval) at 5% significance level.

Students who were most likely to report heavy alcohol use: were older than 15 years; had fair or poor relationship with both parents; had divorced parents; perceived the father as a liberal person; had no religious affiliation; and had a formal job.

Considering the most significant p-values (p<0.001) and odds ratios (OR) that were the farthest from 1.0, factors associated with heavy use of alcohol in the month preceding the survey were: formal work (OR = 1.84), age over 15 years (OR = 1.75) and fair or poor relationship with the mother (OR = 1.61).

Formal work appears as the variable most strongly associated with heavy alcohol use among adolescents. Students who had a formal job were 84% more likely to report heavy use of alcohol compared to those without formal employment.

Sports practice and the perception of having a liberal mother did not show any statistical significance and were disregarded. The perception of a liberal father was associated with heavy use of alcohol among students (OR = 0.87, p = 0.01).

However, among family-related variables, the father-child relationship rather than the student's perception of his/her father as a liberal person had a stronger association with the outcome. Having a fair or poor relationship with the mother increased by 61% the likelihood of an adolescent to report heavy alcohol use. The same was seen among those with a negative relationship with the father, though with less strength (likelihood increased by 46%). In this model, those

**Table 2.** Logistic regression analysis of variables associated with heavy alcohol use among students in public elementary and high schools. Brazilian capitals, 2004.

| Variable | | p | Odds Ratio | 95% CI |
|---|---|---|---|---|
| Intercept | | <0.001 | - | - |
| Gender (ref.: female) | Male | 0.04 | 1.10 | 1.00;1.20 |
| Perception of the father (ref.: liberal) | Not liberal | 0.01 | 0.87 | 0.78;0.97 |
| Age (ref: <15 years old) | ≥15 years old | <0.001 | 1.75 | 1.61;1.89 |
| Relationship with the mother (ref: good) | Fair/poor | <0.001 | 1.61 | 1.41;1.84 |
| Relationship with the father (ref: good) | Fair/poor | <0.001 | 1.46 | 1.31;1.63 |
| Relationship with the parents (ref: they live together) | They do not live together | 0.001 | 1.18 | 1.07;1.31 |
| Religion (ref: does not follow) | Follows | <0.001 | 0.83 | 0.76;0.91 |
| Work (ref: does not work + informal work) | (formal) Work | <0.001 | 1.84 | 1.67;2.04 |

who followed a religion were 17% less likely to report heavy use of alcohol considering the other variables used for constructing the model.

The statistical comparison of the ROC curve estimates between the development and validation databases showed no statistical difference between the two ROC curves assessed (p = 0.76).

**DISCUSSION**

Self-administered questionnaire in the classroom is the most widely used method to assess the prevalence of substance use among students due to its better cost-benefit relation, low rates of refusal and assurance of anonymity.[22] However, it has some limitations. First, the assessment in the classroom may exclude school dropouts or those students who were absent on the day of the interview since they can be often absent or have serious problems due to substance use. Furthermore, the responses were reports of drug use rather than measures of consumption, which may have led to underreporting of actual cases for students' fear of providing information, or over-reporting due to students providing false information.

Similarly, the results cannot be extrapolated to the reality of students in private schools in Brazil, because the sample is representative only of the student population of public schools.

Brazilians are culturally permissive toward alcohol use, and its advertising is much appreciated for its quality and creativity. Adolescents and young adults are particularly exposed to alcohol, and they are even a target population.[17] In Brazil the legal age to consume alcohol is 18, but this law is not effectively enforced and underage adolescents can easily buy alcohol.[13]

Adolescents who consume alcohol may have several negative consequences, from social and school problems to more serious behaviors such as unprotected and/or non-consenting sex, increased risk of suicide or homicide and alcohol-related injuries.[8] To that regard, many studies have investigated factors associated with alcohol and other drug use in this age group.[18] The finding of 8.9% of adolescents reporting heavy use of alcohol during the month preceding the survey in a representative sample of public school students from capital cities may be indicative of a serious public health issue.

Studies in adults have showed males are more prone to heavy use of alcohol and they also have greater consequences due to its use while women suffer more from violence related to alcohol consumption.[a] The data in the present study indicate slight gender differences. Boys were 10% more likely to report heavy alcohol use than girls. Yet recent data from an epidemiological survey among American students did not find any significant differences in heavy alcohol consumption between males and females.[6]

Factors related to family structure and relationships have been extensively studied in association with alcohol.[5] The present study showed that heavy alcohol use was strongly associated with having a poor relationship with either the father or the mother, perception of the father as a liberal person and divorced parents, which corroborates other studies.[26] However, the association between the parent-child relationship and heavy alcohol consumption was stronger among those whose parents apparently were liberal, suggesting that the quality of the relationship should more strongly considered in the context of behaviors that aim at monitoring the adolescent. Perceiving parents as liberal can be a way of masking relationships characterized by misunderstanding, rejection or abandonment.[26]

Consistent with other studies,[25] belonging to a religion was negatively associated with greater consumption of alcohol among adolescents and young people. The mechanisms involved are not clear yet, and this finding

ᵃ Pyne HH, Claeson M, Correia M. Gender dimensions of alcohol consumption and alcohol-related problems in Latin America and the Caribbean. Washington: The World Bank; 2002. (World Bank Discussion Paper, 433).

may be attributed to the public aspects of religion, such as participation in religious groups,[1] or to the private domain, such as individual prayer and the importance given to religion.[15] One of the few qualitative studies on the subject confirms the quantitative findings, indicating that the major difference between drug users and non-users among low-income Brazilian adolescents was their religiosity and their family's. The authors also found that 81% of non-drug users practiced a religion of their own free will and out of admiration, and that only 13% of drug users did the same.[20]

Lorente et al[14] (2004) reported a positive relationship between alcohol use and sports practice among French students that was even more evident among those who practiced team sports. Similarly, Eitler et al[7] (2003) found a stronger association between alcohol use and students who played soccer. In our study, however, sports practice was not associated with heavy alcohol use among adolescents. One possible explanation could be a narrow interpretation of the question as students may have considered physical education, which is compulsory in schools, "sports practice" given the high number of positive answers to this question.

However, despite the positive association between sports activities and alcohol use, this relationship seems to vary depending on factors such as skin color, gender, identity, type of sports, number of participants and regular extracurricular activity.[16] Thus, more in-depth studies are required to further explore this subject, preferably with a qualitative design.

Heavy use of alcohol was higher among students who worked than those who did not. This is not a consensus in the literature. Some studies have postulated that adolescents who do not work are more inclined to spend their free time consuming alcohol and other drugs,[2] while others claim that work is a risk factor for substance use among adolescents.[11]

In the present study, work was the factor most strongly associated with heavy alcohol use, followed by age over 15 years. Greater access to alcoholic beverages due to their own income is possibly one of the factors involved in greater heavy alcohol use among working adolescents. Another reason would be exposure to an environment outside the family, which together with taking on an adult role, would promote their early independence and lack of parental supervision, a factor previously discussed as associated with heavy alcohol use.[23,24]

In conclusion, despite its limitations as a cross-sectional study, the present study found that heavy alcohol use among students in public middle and high schools in capital cities is associated with personal and family variables. While maintaining a good relationship with the parents and following a religion seem negatively associated with heavy alcohol use, working was shown as the most positively associated factor. The prevention of alcohol use does not depend on public and private programs only, but also on strengthening family and religious bonds.

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