

Alcohol and alcoholism among Brazilian adolescent public-school students

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Keywords

Alcoholism. Adolescent. Child labor. Adolescent behavior. Students.

Abstract

Objective

To estimate the prevalence of alcohol consumption and alcoholism among working and non-working adolescents.

Methods

Cross-sectional study with a systematic, stratified sample 993 working adolescents and 1,725 non-working adolescents. The study included students enrolled in 1998 in the state public network schools of a city in Center-Western Brazil. An anonymous, self-administered questionnaire was completed by subjects in the classroom. Univariate and bivariate analyses and logistic regression were used.

Results

We found prevalences of 71.3% for alcohol consumption and 13.4% for alcoholism in the total sample, and higher prevalences among working students (81.0% and 14.9%) than among non-workers (65.8% and 12.6%). In addition to the association between alcohol use and work, we found both differences and similarities between the two groups. Alcoholism is not associated with work but is associated with male sex (OR=1.61; 95% CI: 1.18-2.19) and family history of alcohol use among both non-workers (OR=2.19; 95% CI: 1.60-2.99) and workers (OR=2.10; 95% CI: 1.42-3.12).

Conclusions

The results of the present study indicate a high prevalence of alcohol consumption and alcoholism, which is higher among working adolescents. Sociodemographic, family, and work-related factors must be considered when attempting to implement educational measures aimed at changing alcohol-related behaviors in this population.

INTRODUCTION

The improper use of alcoholic beverages is considered as a serious public health problem. In addition to its prevalence among the adult population, this behavior is equally present among adolescents, with effects on their physical and mental health. Alcohol consumption may be a consequence of contemporary lifestyle, high degrees of emotional stress and anxiety, low self-esteem, feelings of depression, susceptibility to peer-pressure, and school-related problems.^{3,8}

Different fields of scientific knowledge adopt dif-

ferent definitions for the terms 'use', 'abuse', and 'dependence'. The International Classification of Diseases (ICD-10) defines 'use' as any form of consumption, regardless of frequency; 'abuse' as consumption associated with adverse consequences, although not characterized as 'dependence'. The latter manifests itself when substance use becomes a dysfunctional state.

Excessive alcohol ingestion is a problematic issue. In Brazil, studies report prevalence rates for alcoholism between 3.0% and 6.0% among the general population. Alcoholism is the third most frequent reason

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for work absenteeism and is responsible for high rates of early retirement and work and traffic accidents and for a considerable proportion of the occupation of hospital beds.^{1,2}

For decades already, the World Health Organization (WHO) has defined alcoholism as a complex disease. Alcohol acts as a determinant factor on preexisting psychosomatic causes, requiring wide-ranging prophylactic and therapeutic treatment processes.

There is extensive literature on the consumption of psychoactive substances – including alcohol –, using different methodologies and approaches, both among the general population and in specific groups.^{1,2,15} Regarding working adolescents, studies have identified as risk factors for alcohol consumption variables such as age, family relationships, religion, and workload. Adolescents working full or part-time show higher rates of alcohol use than those who do not work.^{8,11,12,18,20}

However, investigations of alcohol use among working and non-working adolescents in Brazil are sparse. For more than two decades, alcohol has occupied the first place in terms of consumption among state public school students, way ahead of other substances. The most recent study on this subject,^{*} including 10 Brazilian capitals, found a discreet predominance of alcohol use among males, and an early onset of alcohol consumption (10-12 years).

Knowledge of the relationship between work and alcohol use during adolescence is of great importance, since this is the beginning of adult life. The adoption of both behaviors at this stage in human development may be considered as problematic, given that alcohol consumption is a potential hazard to health, and it is possible that this behavior be continued in adulthood. On the other hand, there is a belief that work helps to keep school-age adolescents out of the streets and contributes towards socialization by means of the contact with the positive values of adults. However, some studies report an association between work and dysfunctional behaviors, such as the inadequate use of alcohol.^{8,10-12}

The aim of the present study was to estimate the prevalence of alcohol consumption and alcoholism among working and non-working adolescent students and to determine the risk factors associated with this consumption.

METHODS

This is a cross-sectional study. The study population is composed of adolescents attending state public primary and secondary schools in the city of Cuiabá, Center-Western Brazil, in 1998. Eligible students were enrolled in public network schools and were between 10 and 20 years of age.¹¹ Working and non-working students were identified according to Souza et al^{**} (2000), using the classification criteria established by the Brazilian Institute for Geography and Statistics (*Instituto Brasileiro de Geografia e Estatística* - IBGE).

We adopted a two-stage, systematic stratified sampling strategy. In the first stage, strata were randomly selected (primary school, secondary school, and young adult education). In the second stage, subjects were selected with probability proportional to the size of each cluster (class), which was estimated based on data provided by the State of Mato Grosso Secretariat of Education.

The following parameters were considered when calculating sample size: the existing prevalence of drug consumption among the population in 1995 (25.2%),¹⁶ the estimated proportion of working adolescents (25%); the prevalence of lifetime drug use among non-workers (15%); and the minimal prevalence to be detected among workers (20%). Assuming 80% power and a 5% significance level, the minimal sample size required was 643 students in the working group and 1,929 students in the non-working group.

The instrument adopted for characterizing the consumption of psychoactive substances was that proposed by Smart et al,¹⁴ adapted to Brazilian settings,^{*} and previously tested in Cuiabá.¹⁶ Questions regarding alcoholism, work, and family were added to the questionnaire. Questionnaire administration was anonymous and was carried out collectively in the classroom, without the presence of a teacher, by carefully trained university students. The dependent variables – outcome events – were alcohol use (yes/no), and alcoholism (positive/negative). To evaluate 'lifetime alcohol use', we adopted the classification used in national surveys,^{*} which considers the use of any psychotropic substance at least once in life.

In order to detect alcoholism, we employed the CAGE test with a cutoff of two or more positive answers, which suggest positive screening for alcohol dependence.^{5,8,9}

*Galduróz JCF, Nodo AR, Carlini EA. IV levantamento sobre o uso de drogas entre estudantes de 1º e 2º graus em 10 capitais brasileiras, 1997. São Paulo: Centro Brasileiro de Informações sobre Drogas Psicotrópicas, Departamento de Psicobiologia da Universidade Federal de São Paulo; 1997. p. 130.

**Souza DPO, Câmara VM, Martins DTO, Valente JG. Confiabilidade do instrumento: construção de questões sobre o trabalho para identificar estudantes adolescentes trabalhadores da rede estadual de ensino de Cuiabá. In: VI Congresso de Saúde Coletiva: O sujeito na Saúde Coletiva 2000. Available on-line at <http://www.lsc.ufba.br/saude2000> [12 Oct 2004]

This test consists of four questions on the use of alcoholic beverages: 1) Have you ever felt you should cut down on your drinking? 2) Have people annoyed you by criticizing your drinking? 3) Have you ever felt bad or guilty about your drinking? 4) Have you ever had an eye-opener first thing in the morning to steady nerves or get rid of a hangover? The CAGE questions were included in the instrument amidst other questions – leading the subject to answer these questions casually – so as to counter the tendency of alcoholics to deny their condition.⁸

The independent explanatory variables in the study included work (yes/no), sex (female/male), age (15-20/10-14), race (white/nonwhite), religion (catholic/others), with whom the subject lives (parents/other), family alcohol use (yes/no), and family socio-economic level (A+B+C/D+E). Socio-economic level was evaluated based on the sum of parents' schooling and the possession of certain durable consumer goods, following the methodology proposed by the Brazilian Association of Market Research Institutes (*Associação Brasileira dos Institutos de Pesquisa de Mercado – Abipeme*). Variable *race* was categorized as 'white' or 'nonwhite' and religion as 'catholic' and 'others'.

Initially, tabulation was performed in order to estimate the prevalence of alcohol consumption and alcoholism. Crude and adjusted associations between socio-demographic/family variables and alcohol consumption/alcoholism among working and non-working adolescents were assessed using odds ratios (OR) and their respective 95% confidence intervals. Associations whose odds ratios did not include the unit were considered as significant. The control of confounders and interactions (modification of effect) was

performed by logistic regression.⁷ This model included all variables that presented *p*-values below 0.25 in crude analysis. We began with a saturated model, including the exposure variable and all potential confounders and interaction terms. Interactions were assessed by comparing the saturated model without each of the interaction terms using the likelihood ratio test. The presence of confounders was analyzed by removing co-variables, one at a time, according to the *p*>0.05 criterion, and verifying whether their removal caused changes greater than 10% on the coefficients of the remaining variables and subsequently comparing the new OR, without each co-variable, with those obtained in the saturated model.

Data entry and validation were performed using Epi Info software, version 6.02. Data were entered twice in separate files, which were compared, and any differences identified were corrected. Critical data analysis was carried out according to the procedures adopted in national surveys.* SPSS 9.0 software was used for statistical analysis.

The present study was approved by the Research Ethics Committee of the *Universidade Federal do Mato Grosso* and by the Research Committee of the *Universidade Federal de São Paulo, Escola Paulista de Medicina*.

RESULTS

There were no refusals in 3,479 questionnaires were administered. Twenty-four questionnaires (0.06%) were invalidated due to positive answer to a fictitious question regarding a non-psychoactive substance, 31 (0.89%) for not answering the questions

Table 1 - Socio-demographic and family characteristics of adolescent students. Cuiabá, MT, 1998.

Variables	Workers (N=993) N (%)	Non-workers (N=1,725) N (%)	Total* (N=2,718) N (%)
Age group			
15-20 years	753 (75.8)	765 (44.3)	1,518 (55.9)
10-14 years	240 (24.2)	960 (55.7)	1,200 (44.1)
Sex			
Female	466 (47.2)	1,046 (61.2)	1,512 (56.1)
Male	521 (52.8)	664 (38.8)	1,185 (43.9)
Race/color			
Nonwhite	634 (66.5)	1,054 (63.3)	1,688 (64.5)
white	320 (33.5)	610 (36.7)	930 (35.5)
Religion			
Catholic	572 (59.0)	1,047 (62.0)	1,619 (60.9)
Other	397 (41.0)	643 (38.0)	1,040 (39.1)
Level			
A+B+C	698 (70.3)	1,264 (73.3)	1,962 (72.2)
D+E	295 (29.7)	461 (26.7)	756 (27.8)
Living with			
Others	439 (45.6)	560 (32.5)	999 (37.8)
Parents	524 (54.4)	1,123 (65.1)	1,647 (62.2)
Alcohol in family			
Yes	483 (49.4)	797 (46.7)	1,280 (47.7)
No	494 (50.6)	909 (53.3)	1,403 (52.3)

*Totals do not coincide due to missing information for some of the variables

*See footnote on page 2.

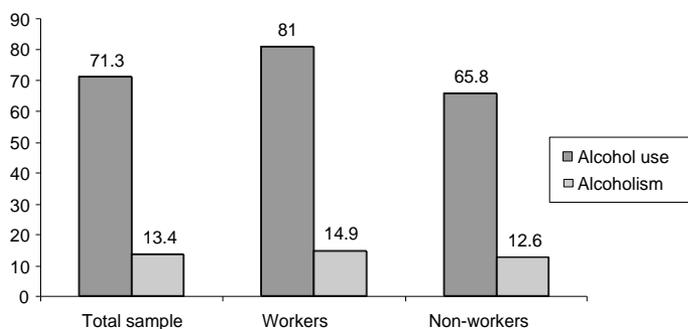


Figure 1 - Prevalence of alcohol use and alcoholism in the total sample and among working and non-working adolescents. (N=2,718)

on work, and 706 (20.3%) due to the respondent being older than 20 years. Of the minimum sample required (2,572), information was obtained on 2,718 adolescents, of which 993 were workers and 1,725 were non-workers, representing 89.4% of the predicted sample size. The official estimate of the total number of enrolled students provided by the State of Mato Grosso Secretariat of Education for 1997 indicated about 61,889 students. Thus, the studied sample contained approximately 4.39% of the total number of students. Missing information for each variable did not exceed 3.8% of the expected answers.

Table 1 presents the characteristics of the total sample of working and non-working adolescents according to socio-demographic and family variables. There is a predominance of female adolescents (56.1%), of the 15-20 years age group (55.9%), of Catholics (60.9%), of nonwhite race/color (64.5%), of high socio-economic level (72.2%), of adolescents living with parents (62.2%), and of no family history of alcohol use (52.8%). Among workers, there was a greater

proportion of men (52.8%) and of the 15-20 years age group (75.8%), whereas among non-workers there was a predominance of women (61.2%) and of the 10-14 years age group (55.7%).

Of the participants, 1,928 (71.3%) reported using alcoholic beverages (Figure 1). Bottled or draught beer was the most consumed beverage, being mentioned by the majority of adolescents. Mean age of onset of drinking was approximately 13.09 years (SD=2.66) among workers and 12.43 years (SD=2.62)

among non-workers.

The prevalence of consumers of alcoholic beverages showed an increasing trend along with increases in age (Figure 2).

Figure 1 shows that the prevalence of alcohol use among workers (81.0%) was greater than among non-workers (65.8%), a statistically significant difference ($p<0.001$). Alcohol was associated, among both workers and non-workers, with age (15-20 years age group), high socio-economic status (A+B+C), not living with parents, and family history of alcohol use (Table 2).

In multivariate analysis by logistic regression (adjusted OR), the following remained associated with alcohol use: older age group, better socioeconomic level, not living with parents, and family history of alcohol use. Sex lost its association with alcohol consumption among workers. Religion lost its association among non-workers, but remained associated with alcohol consumption among workers.

Table 2 - Association between socio-demographic and family variables with alcohol consumption among workers and non-workers. Crude and adjusted odds ratios. Cuiabá, MT, 1998.

Variable	N (%)	Workers		Alcohol use		Non-workers	
		OR _{crude}	OR _{adjusted}	N (%)	OR _{crude}	OR _{adjusted}	
Age group							
15-20 years	628 (83.4)	2.27 (1.61-3.19)**	2.66 (2.16-3.27)**	593 (77.7)	2.71 (2.19-3.36)**	1.78 (1.02-3.09)**	
10-14 years	169 (70.4)	1.00	1.00	538 (56.2)	1.00	1.00	
Sex							
Female	390 (84.1)	1.48 (1.07-2.04)*	0.99 (0.80-1.23)	690 (66.1)	1.01 (0.83-1.25)	0.97 (0.75-1.26)	
Male	402 (78.1)	1.00	1.00	434 (65.7)	1.00	1.00	
Race/color							
Nonwhite	504 (80.4)	0.91 (0.64-1.29)	0.97 (0.78-1.20)	699 (66.5)	1.09 (0.88-1.35)	1.01 (0.78-1.31)	
White	260 (81.8)	1.00	1.00	392 (64.5)	1.00	1.00	
Religion							
Catholic	468 (82.5)	1.27 (0.92-1.76)	1.55 (1.23-1.96)**	730 (69.9)	1.56 (1.27-1.92)**	1.17 (0.82-1.67)	
Other	311 (78.7)	1.00	1.00	382 (59.7)	1.00	1.00	
Level							
A+B+C	578 (83.0)	1.54 (1.10-2.15)*	1.78 (1.41-2.24)**	862 (68.2)	1.51 (1.21-1.88)**	1.80 (1.36-2.39)**	
D+E	219 (76.0)	1.00	1.00	269 (58.7)	1.00	1.00	
Living with							
Others	377 (86.1)	1.82 (1.29-2.55)**	1.55 (1.25-1.94)**	398 (71.1)	1.41 (1.13-1.76)**	1.49 (1.13-1.95)**	
Parents	404 (77.2)	1.00	1.00	710 (63.4)	1.00	1.00	
Alcohol in family							
Yes	411 (85.3)	1.77 (1.28-2.46)**	2.07 (1.68-2.55)**	601 (75.4)	2.30 (1.87-2.84)**	2.93 (2.12-4.05)**	
No	378 (76.5)	1.00	1.00	518 (57.0)	1.00	1.00	

Note: values of 1.00 in the crude and adjusted OR columns indicate that the category was considered as the reference

OR: Odds ratios

* $p<0.01$; ** $p<0.001$

As to alcoholism, 365 students gave positive answers to two or more CAGE questions. The data show a prevalence of alcoholism of 13.4% in the sample, with 14.9% among workers and 12.6% among non-workers (Figure 1). This difference was not statistically significant. Unlike what was observed with alcohol consumption, there was a predominance of alcoholism among male (16.5%) and non-catholic (16.4%) workers, and among lower socio-economic level (D+E) non-workers.

The crude ORs show an association, among working adolescents, between socio-economic level and family history of alcohol use and alcoholism. Among non-working adolescents, alcoholism was associated with male sex and family history of alcohol use. The association between higher socio-economic level (A+B+C) and alcoholism found among workers lost statistical significance in adjusted analysis. Among non-workers, male sex and family history remained associated with alcoholism (Table 3).

DISCUSSION

Cross-sectional designs show limitations regarding the establishment of causal relationships, since information on both exposure and outcome are collected simultaneously. Other limitations of the present study should also be mentioned. The first concerns its comparability with other studies, since only a few surveys have been conducted with the goal of investigating alcohol

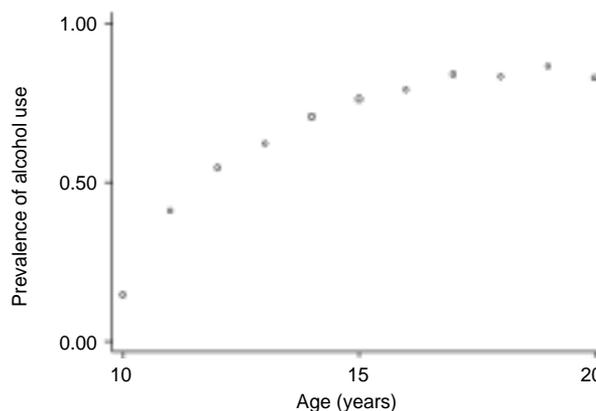


Figure 2 - Prevalence of alcohol use according do age group among adolescent students. (N=2,718)

use and alcoholism among working and non-working students. The second is related to the use of the CAGE test as a criterion for detecting alcoholism, since this is a screening, rather than a diagnostic test.¹ The third is the potential information bias: even though anonymity is ensured, it is possible that some students have omitted alcohol use due to distrust or recall mistakes. Even though the administered questionnaire investigates the reported use of drugs rather than consumption itself, this instrument has been used in this country with good agreement. This is a non-validated instrument, since there is no gold-standard for measuring such behaviors among adolescents. The 10.5% losses in the non-worker group may be attributed to a number of factors, including absence to school on the day the questionnaire was administered, school dropout, and moving to other locations (which could potentially be related to alcohol use).

Table 3 - Association between socio-demographic and family variables and with occurrence of alcoholism among workers and non-workers. Crude and adjusted odds ratios (OR). Cuiabá, MT, 1998.

Variável	N(%)	Alcoholism				
		Workers OR _{crude}	OR _{adjusted}	N(%)	Non-workers OR _{crude}	OR _{adjusted}
Age group						
15-20 years	114 (15.1)	1.08 (0.71-1.63)	1.09 (0.70-1.71)	104 (13.6)	1.17 (0.88-1.56)	1.16 (0.85-1.58)
10-14 years	34 (14.2)	1.00	1.00	113 (11.8)	1.00	1.00
Sex						
Female	61 (13.1)	1.00	1.00	112 (10.7)	1.00	1.00
Male	86 (16.5)	1.31 (0.92-1.87)	1.46 (0.98-2.17)	104 (15.7)	1.54 (1.16-2.06)**	1.61 (1.18-2.19)*
Race/color						
Nonwhite	96 (15.1)	1.06 (0.72-1.55)	1.03 (0.69-1.54)	142 (13.5)	1.28 (0.94-1.75)	1.22 (0.88-1.69)
White	46 (14.4)	1.00	1.00	66 (10.8)	1.00	1.00
Religion						
Catholic	77 (13.5)	1.00	1.00	126 (12.0)	1.00	1.00
Others	65 (16.4)	0.79 (0.55-1.13)	0.93 (0.54-1.59)	87 (13.5)	0.87 (0.65-1.17)	0.96 (0.65-1.43)
Level						
A+B+C	115 (16.5)	1.56 (1.03-2.36)*	1.46 (0.92-2.31)	154 (12.2)	1.00	1.00
D+E	33 (11.2)	1.00	1.00	63 (13.7)	0.87 (0.64-1.20)	0.88 (0.62-1.25)
Living with						
Others	76 (17.3)	1.40 (0.98-2.00)	1.44 (0.82-2.52)	72 (12.9)	1.04 (0.77-1.41)	1.17 (0.70-1.96)
parents	68 (13.0)	1.00	1.00	139 (12.4)	1.00	1.00
Alcohol in family						
Yes	93 (19.3)	1.94 (1.35-2.79)**	2.10 (1.42-3.12)**	136 (17.1)	2.13 (1.58-2.86)**	2.19 (1.60-2.99)**
No	54 (10.9)	1.00	1.00	80 (8.8)	1.00	1.00

Note: values of 1.00 in the crude and adjusted OR columns indicate that the category was considered as the reference
*p<0.01; **p<0.001

However, the proportion of losses in the present study does not compromise its results.

Alcohol abuse among adolescents is a relevant issue to Public Health insofar as it leads to frequent hazard to the user's health. The prevalence of use of alcoholic beverages in life among adolescent students in Cuiabá is high both among workers (81.0%) and non-workers (65.8%), and drinking begins at an early age. These data are in agreement with those found in the four surveys carried out in Brazil in 1987, '89, and '97* (above 65%). A different study²⁰ found a prevalence of alcohol use in the preceding year of 32.7% among adolescents aged 12-17 years.

Regarding alcoholism, a study carried out in Rio Grande do Sul, Southern Brazil,¹⁷ found an 8.3% prevalence of positive CAGE questionnaires, a lower frequency than that found in Cuiabá in the total sample (13.4%) and among working (14.9%) and non-working (12.6%) students. These data suggest an earlier onset of alcohol use among the teenagers in our sample.

Alcohol consumption is likely to contribute to emotional stress and other problems in this group of adolescents, which suggests a number of possible interpretations, widely discussed in the literature.^{7,10,12,20} Noteworthy among these interpretations are the notions that economic independence will facilitate access to alcohol; that adolescents will feel the need to be accepted by adult colleagues who use alcohol; that work-related activities may be stressful for adolescents, who would seek relief in drinking; that the need for work early in life and the long working hours may lead adolescents to a lack of commitment to school activities; and of the importance of the premature transition into adult roles, together with the loss of parental control.

Nationwide surveys and studies^{17,*} show a slight predominance of alcohol consumption among males. This was not the case with the adolescents in Cuiabá, where there was a greater proportion of consumption among females. Gender-specific consumption patterns have been the subject of debate in studies involving the epidemiology of alcoholism.¹ We should mention the importance of the conquests made by women in the last decades. In addition to financial independence, female adolescents have greater freedom to frequent establishments where alcoholic beverages are consumed, previously restricted to men, a behavior that is accompanied by increased prevalence of diseases previously associated to male sex.

Concerning alcoholism, in contrast to alcohol con-

sumption, men showed greater prevalence of positive CAGE tests.

There were no significant associations between alcohol use and racial group among both workers and non-workers, although a greater proportion of nonwhite subjects reported alcohol use.

Regarding socio-economic status, it has been reported that "unlike what one would expect, drug use is not the attribute of students of any specific social class".* In the present investigation, with the exception of non-working students with positive CAGE tests, there was an association between alcoholism and alcohol use and higher socio-economic classes (A+B+C). A similar result was reported in a study of the student population² that found decreased alcohol use among the less favored socio-economic levels (C+D) when compared to higher ones. Likewise, data from a study of the general population¹ indicate an association between abstinence and lower income levels.

Investigations of alcohol use, alcoholism, and religion among adolescents are rare in Brazil. In the present study, we found that working and non-working adolescent catholic students showed greater risk of alcohol consumption. A similar result was found in a study carried out in Porto Alegre,¹⁷ which found that a greater proportion of catholic students reported having tried alcoholic beverages.

As to alcoholism, our data indicate greater prevalence of positive CAGE tests among workers and non-catholic non-workers, although without reaching statistical significance. Likewise, among adolescents from Porto Alegre, non-catholics showed greater positivity to the CAGE test.¹⁷ These results suggest a need for investigating the way in which norms regarding alcohol consumption and abstinence are posed by the different religions present in our society.

Another issue regarding alcohol use and alcoholism discussed by authors in this field is the influence of family factors.^{4,13,19} In the present study, not living with parents increased the odds of consumption of alcoholic beverages in both working and non-working students. Although addressing the use of tobacco and marijuana rather than alcohol consumption, surveys conducted among students² also show increased risk of consumption of both substances among students that live with other persons when compared to those who live with their parents.

We also found greater alcohol consumption and alcoholism among adolescents with family history of

*See footnote on page 2.

alcohol use. A similar finding, although with different objectives, was found in family studies,^{13,19} in which the children of alcoholic parents show greater occurrence of behavioral problems when compared with the children of abstinent parents. This suggests that alcohol consumption by parents may be a risk factor for the development of dependence in children.

The findings regarding the consumption of alcoholic beverages among adolescent students in Cuiabá may, to a great extent, reflect the social and cultural status of the habit of recreational drinking. Notwithstanding, excessive drinking, even if not constituting alcoholism, may lead adolescents to develop the latter.

Although alcohol is legal in Brazil, and its consumption socially accepted, one must keep in mind the existence of laws prohibiting the sale of alcohol to minors. These laws are not being obeyed and, directly or indirectly, alcohol consumption is being stimulated by alcoholic beverage advertisement.

There is a need to revise the legislation on the advertisement of such products.*

Work was associated with alcohol use, indicating its role as a potential risk factor among students. Although differences were not significant with respect to alcoholism, our data suggest that early work does not 'prevent' alcohol use in this population. On the contrary, many situations related to labor activities may stimulate the access to, and consumption of alcoholic beverages, thus constituting an exposure factor.

Studies with different designs must be conducted in order to allow for more specific analyses of the role of work, since, in addition to finding high rates of alcohol consumption and alcoholism, we found both similarities and differences between working and non-working students. Healthcare and educational measures aimed at the adolescent student population must be designed in order to reduce the prevalence and the early onset of alcohol consumption.

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*See footnote on page 2.

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