

# Alcohol use and sociodemographic characteristics in a cohort of Brazilian school adolescents: observational study

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## ABSTRACT

**Objective:** to investigate the association between alcohol use and sociodemographic characteristics in a cohort of Brazilian school adolescents. **Methods:** this was a descriptive, cross-sectional and observational study, carried out in three public schools, located in the cities of Belo Horizonte and Contagem, in the state of Minas Gerais, Brazil, with 370 adolescents aged between 12 and 18 years were interviewed, after approval by the ethics committee. In order to characterize the participants and the use the *Alcohol Use Disorders Identification Test* was applied. For data processing and analysis, Chi-square, Fisher's Exact and Kruskal-Wallis tests were used. **Results:** the use of alcohol was significantly higher among Black adolescents attending high school ( $p=0.007$ ), with single marital status, but dating ( $0.005$ ), and who had paid work ( $p=0.001$ ). **Conclusions:** alcohol use was associated with age, racial characteristics, affective state and paid activities. Identifying adolescents with such characteristics can favor developing prevention strategies.

**Descriptors:** Adolescent; Health Risk Behaviors; Underage Drinking; Binge Drinking; Sociodemographic Factors.

## RESUMO

**Objetivo:** investigar a associação entre uso de álcool e características sociodemográficas de uma coorte de adolescentes escolares brasileiros. **Métodos:** estudo descritivo, transversal e observacional, realizado em três escolas públicas, localizadas nas cidades de Belo Horizonte e Contagem, no estado de Minas Gerais, Brasil, com 370 adolescentes entre 12 e 18 anos, entrevistados após aprovação do comitê de ética. Para caracterizar os participantes e o uso de álcool, foi aplicado o *Alcohol Use Disorders Identification Test*. Para processamento e análise dos dados, foram utilizados os testes Qui-quadrado, Exato de Fisher e Kruskal-Wallis. **Resultados:** o uso de álcool foi significativamente maior entre adolescentes negros que cursavam o ensino médio ( $p=0,007$ ), solteiros, comprometidos afetivamente ( $0,005$ ) e que exerciam trabalho remunerado ( $p=0,001$ ). **Conclusões:** o uso de álcool foi associado à idade, às características raciais, ao estado afetivo e à prática de atividades remuneradas. Identificar adolescentes com tais características pode favorecer o desenvolvimento de estratégias de prevenção do uso abusivo de álcool.

**Descritores:** Adolescente; Comportamentos de Risco à Saúde; Consumo de Álcool por Menores; Consumo Excessivo de Bebidas Alcoólicas; Fatores Sociodemográficos.

## RESUMEN

**Objetivo:** investigar la asociación entre consumo de alcohol y características sociodemográficas de una cohorte de adolescentes de escuelas brasileñas. **Métodos:** estudio descriptivo, transversal y observacional, realizado en tres escuelas públicas, ubicadas en las ciudades de Belo Horizonte y Contagem, estado de Minas Gerais, Brasil, con 370 adolescentes entre 12 y 18 años, entrevistados después de la aprobación del comité de ética. Para caracterizar a los participantes y su consumo de alcohol, se aplicó el *Alcohol Use Disorders Identification Test*. Pruebas de Chi- cuadrado, Exacta de Fisher y Kruskal-Wallis fueron utilizados para procesamiento y análisis de datos. **Resultados:** el consumo de alcohol fue significativamente mayor entre adolescentes negros que estaban en la escuela secundaria ( $p=0,007$ ), solteros, comprometidos emocionalmente ( $0,005$ ) y que tenían trabajo remunerado ( $p=0,001$ ). **Conclusiones:** el consumo de alcohol se asoció con la edad, las características raciales, el estado afectivo y la práctica de actividades remuneradas. Identificar a adolescentes con tales características puede favorecer el desarrollo de estrategias para prevenir el abuso de alcohol.

**Descriptores:** Adolescente; Conductas de Riesgo para la Salud; Consumo de Alcohol en Menores; Consumo Excesivo de Bebidas Alcohólicas; Factores Sociodemográficos.

## INTRODUCTION

Alcohol consumption represents a global public health problem, affecting almost all cultures and age ranges, with emphasis in adolescence<sup>1</sup>. Alcohol is the most commonly used psychoactive substance by adolescents. It is known that the first contacts with alcohol occur in early ages, between 10 and 13 years, predominantly at the age 15, when these individuals are attending secondary school<sup>2</sup>. There are reports of even earlier contact in pre-adolescence, around nine years of age<sup>3</sup>.

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This is a complex problem, for the individual, family and society, capable of inducing adolescents to various risky behaviors, such as the use of other legal and illicit drugs, traffic accidents, violence of different types, leading to poor school performance, early pregnancies, cognition deficits, brain development impairment, conflicting relationships and even death<sup>1,4</sup>.

Given the complexity that surrounds adolescence, the problem of alcohol use among this population has attracted the attention of scientists worldwide. Adolescence is a critical period, when physical, emotional, social and behavioral transformations occur<sup>5</sup>. Worldwide<sup>6</sup>, adolescence is comprised between the age range of ten to 19 years, while in Brazil it varies from 12 to 18 years<sup>7</sup>.

A North American study highlighted the negative effects of alcohol use on adolescents' brain and behavior. It was found that alcohol use can impair cognition in general, and also affect the structure and function of the brain<sup>8</sup>. Regarding risk factors for early alcohol consumption, several aspects of psychopathology and personality stand out, with emphasis on impulsivity<sup>3</sup>.

A Mexican study that included high school adolescents, using the Alcohol Use Disorders Identification Test (AUDIT) identified a high prevalence of alcohol use, in addition to excessive consumption of that substance in the last year. The main risk factors among adolescents for using alcohol abusively were: association with tobacco and marijuana use, conflicts with peers, socioeconomic vulnerability and type of school<sup>9</sup>.

A recent Brazilian study that used the AUDIT aiming to investigate the correlation between religiosity and alcohol use in adolescents with orofacial clefts showed that those with higher levels of organizational and intrinsic religiosity used alcohol less frequently. On the other hand, older men who did not attend religious practices used alcohol more frequently<sup>10</sup>.

Another Brazilian study that included 2.547 adolescents, has found more frequent alcohol use among older males, with better socioeconomic conditions and were smokers<sup>11</sup>. Among the many factors that can influence the use of alcohol and other drugs, it is possible to mention poor family structure, children born to drug addict parents, parents who have permissible attitudes, having colleagues and friends that were also alcohol users, and finally the school environment<sup>12</sup>.

Thus, the survey performed by the Brazilian Center for Information on Psychotropic Drugs (CEBRID), conducted in 27 Brazilian capitals, with primary and secondary school students, from public and private schools, found that the early use of alcohol in Brazil is an important public health problem, that needs prompt policies aiming to solve this issue<sup>13</sup>. In this context, school environment is a favorable *milieu* for carrying out preventive actions and raising awareness about this serious problem.

Due to this scenario, the objective of this study was to investigate the association between alcohol use and sociodemographic characteristics in a cohort of Brazilian school adolescents, from Belo Horizonte and Contagem.

## METHOD

This was a descriptive, cross-sectional, observational study, carried out between March and May 2023, guided by the STROBE tool. This study was conducted in three public schools in Belo Horizonte, capital of Minas Gerais state, and Contagem, a city also located in this metropolitan area. These three institutions are attended by 150-300 students, belonging predominantly to low socioeconomic classes, with opening hours in the morning, afternoon and night. There are no specific disciplines addressing the use of psychoactive substances.

School adolescents, aged between 12 and 18 years, were included. Adolescents under the influence of psychoactive substances were excluded, since the effects of psychoactive substances can alter behavior and consciousness, leading to answers that could not reflect the reality, causing consequently biases in the research. The sample was non-probabilistic and intentional, consisting of 370 participants, 123 of which were from the first and second schools, and 124 from the third.

Regarding alcohol consumption, the following scores were given: low-risk (risk zone I), risky use (risk zone II), harmful use (risk zone III) and probable alcohol dependence (risk zone IV), and were considered as dependent variables.

The sociodemographic characterization of the sample was performed using a tool created by the authors, which included the following variables: sex, age, ethnicity, education, marital and emotional status, family socioeconomic status, family composition, housing conditions, religious denomination, frequency of religious practice, number of children living in the same house and whether they had paid work or not.

Socioeconomic status, was classified as (low, lower and upper low, medium, lower and upper medium and high), as used by the social assistance at the Hospital for Rehabilitation of Craniofacial Anomalies of the University of São Paulo

(HRAC-USP)<sup>14</sup>. Concerning self-reported color/race, participants were classified as being Black, Brown, Yellow, Indigenous and White according to the criteria adopted by the Brazilian Institute of Geography and Statistics<sup>15</sup>.

Housing classification (own or rented), was based on data from the Continuous National Household Sample Survey<sup>16</sup>. Paid work, was considered the one carried out with the purpose of a certain production, where the individual receives remuneration in money, goods or services.

The AUDIT was applied to investigate alcohol use. It tool was developed by the World Health Organization, and was translated and validated for the Brazilian Portuguese. It has 10 self-administered questions, in which the score varies from zero to 40 points, indicating four alcohol consumption patterns: low-risk use (zero to seven points); risky use (eight to 15 points); harmful use (16 to 19 points) and probable dependence (20 or more points)<sup>17</sup>.

The authors classified as a regular religion practitioner, the individual who used to attend at least twice a week a religious service.

Data collection was performed personally, in a private room, and took 20 minutes on average, and was supervised by the directors of each respective school.

For statistical purposes, the use of alcohol was considered the dependent variable, and the analyzed sociodemographic variables were considered as independent variables. Categorical variables were analyzed using the Chi-square and Fisher's Exact tests, while continuous quantitative variables, were analyzed using the Kruskal-Wallis test.

The study met current research standards and was approved by the Research Ethics Committee of signatory institution. Data collection was performed after parents and/or guardians (TCLE) consent and participants' assent. For adolescents over 18 years of age, consent was requested directly.

## RESULTS

Overall, 370 adolescents were included in this study, with an average age of 14.98 years. The majority of the participants were females (n= 212; 57.3%), with Brown skin color (n= 189; 51.08%), attending high school (n= 216; 58.38%), with single marital status (n= 313; 84.59%), belonging to low socioeconomic status (n=163; 44.05%), living in their own housing (n=293; 79.19%), with any kind of religion (n= 319; 86.45%), mostly Catholics (n=153; 41.35%), regular religion practitioners (n=238; 64.32%), without offspring (100%; n= 370) and without paid work (n=289; 78.11%). Table 1 show data related to alcohol use.

**Table 1:** Distribution of participants regarding alcohol use.  
Contagem, MG, Brazil, 2023.

Variable	n (%)	f(%)
Low-risk	331	89.46
Risky use	27	7.3
Harmful use	5	1.35
Probable dependence	7	1.89

Among them, 122 (32.97%), used to drink alcohol, the majority was classified as risky use (n=27; 7.3%) compared to harmful use (n=5; 1.35%) and probable dependence (n=7; 1.89). %. For analysis purposes, harmful use/probable dependence scores were grouped.

The distribution of participants regarding alcohol use according to other variables is presented in Table 2.

**Table 2:** Distribution of participants regarding alcohol use according to gender, age, color/race, education level, marital/affective status, socioeconomic status, housing, religion, religious practice frequency and paid work. Contagem, BG, Brazil, 2023.

Characteristics	Low-Risk	Risky Use	Harmful Use/ Probable Dependence	p-value
<b>Gender (n=370)</b>				0.522a (v=0.06)
Female	192 (90.57%)	15 (7.08%)	5 (2.36%)	
Male	139 (87.97%)	12 (7.59%)	7 (4.43%)	
<b>Age (n=370)</b>				<0.001***f (=0.03)
Minimum-Maximum	12-18	12-18	13-18	
Q1-Q3	13-16	15-17	15-18	
Median	15	16	17.5	
Medium (standard deviation)	14.85 (±1.97)	15.93(±1.77)	16.5(±1.83)	
<b>Color/race (n=370)</b>				0.003**b
Other/None	11 (68.75%)	4 (25%)	1 (6.25%)	
Caucasians	98 (89.09%)	9 (8.18%)	3 (2.73%)	
Browns	178 (94.18%)	7 (3.7%)	4 (2.12%)	
Blacks	44 (80%)	7 (12.73%)	4 (7.27%)	
<b>Education (n=370)</b>				0.007**a (v=0.16)
Elementary school	147 (95.45%)	5 (3.25%)	2 (1.3%)	
High school	184 (85.19%)	22 (10.19%)	10 (4.63%)	
<b>Marital status (n=370)</b>				0.005**b
Dating	44 (77.19%)	11 (19.3%)	2 (3.51%)	
Single	287 (91.69%)	16 (5.11%)	10 (3.19%)	
<b>Socioeconomic status (n=370)</b>				0.483f ( $\eta^2=0$ )
Very low	42 (12.69%)	4 (14.81%)	3 (25%)	
Low	145 (43.81%)	15 (55.56%)	3 (25%)	
Upper Low	64 (19.34%)	2 (7.41%)	1 (8.33%)	
Lower Middle	40 (12.08%)	5 (18.52%)	2 (16.67%)	
Middle	37 (11.18%)	1 (3.7%)	3 (25%)	
Upper Middle	3 (0.91%)	0 (0%)	0 (0%)	
<b>Housing (n=370)</b>				0.522a (v=0.06)
Rent	71 (92.21%)	5 (6.49%)	1 (1.3%)	
Own	260 (88.74%)	22 (7.51%)	11 (3.75%)	
<b>Having a religion (n=369)</b>				0.925b
No	45 (90%)	4 (8%)	1 (2%)	
Yes	286 (89.66%)	22 (6.9%)	11 (3.45%)	
<b>Religion denomination (n=370)</b>				0.053b
Agnostic	15 (88.24%)	2 (11.76%)	0 (0%)	
Catholic	130 (84.97%)	16 (10.46%)	7 (4.58%)	
No	10 (90.91%)	0 (0%)	1 (9.09%)	
Protestant	140 (95.24%)	4 (2.72%)	3 (2.04%)	
Other	36 (85.71%)	5 (11.9%)	1 (2.38%)	
<b>Religious practioner (n=370)</b>				0.082a (v=0.12)
No	112 (84.85%)	13 (9.85%)	7 (5.3%)	
Yes	219 (92.02%)	14 (5.88%)	5 (2.1%)	
<b>Paid work (n=370)</b>				<0.001***a (v=0.29)
No	272 (94.12%)	13 (4.5%)	4 (1.38%)	
Yes	59 (72.84%)	14 (17.28%)	8 (9.88%)	

**Notes:** a: Chi-square; b: Fisher's Exact; f: Kruskal-Wallis; \*\*\*results with statistical significance

The use of alcohol was significantly higher among adolescents attending high school ( $p=0.007$ ), belonging to Black self-reported color/race ( $p=0.003^{**b}$ ), with single marital status but who were dating ( $0.005^{**b}$ ) and with a paid work ( $p=0.001$ ). It was also found that adolescents who presented risky, harmful use and probable alcohol dependence were older than adolescents at low-risk ( $p<0.001$ ).

Regarding binge drinking, 71 (19%) adolescents reported this practice, as shown in Figure 1.

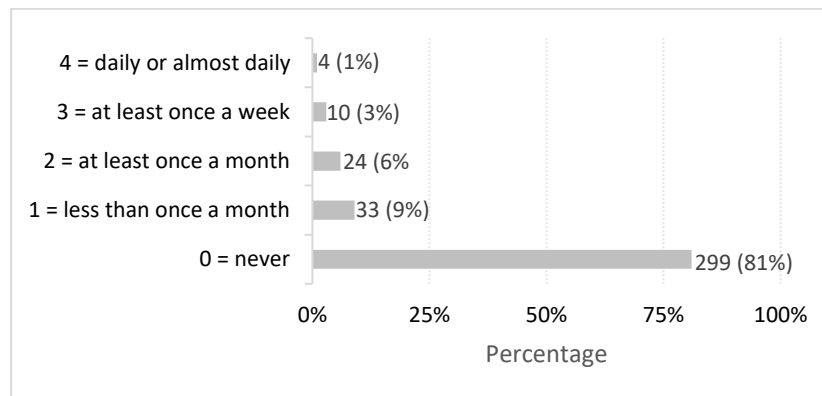


Figure 1: Frequency of binge drinking. Contagem, MG, Brazil, 2023.

## DISCUSSION

The prevalence of alcohol use among adolescents that participated in this study was high (32.97%), mostly among adolescents attending high school, belonging to Black self-reported color/race, with single marital status but who were dating and those with paid work.

This study's findings present higher prevalence than that observed in similar studies, conducted in Brazil and abroad. In Brazil, previous studies have found a prevalence of 21<sup>18</sup> and 22.2%<sup>1</sup> for alcohol consumption among young people aged 12 to 17 years, similar to those observed in the United States (21.2%)<sup>19</sup>. Another study showed that 26.8% of Brazilian adolescents aged between 15 and 19, reported drinking alcoholic beverages<sup>20</sup>. The high frequency of alcohol use, as well as its early onset, as found in this study, was also found in Portugal, where 80.5% of adolescents reported using alcoholic beverages sometime in their lives<sup>21</sup>.

There is evidence that alcohol use increases as school age progresses<sup>22</sup>. The results of this research converge with the literature by identifying a more pronounced alcohol consumption among high school students. A study carried out in Brazilian schools reinforces those alcoholic beverages intake was significantly higher between 16 and 17 years<sup>23</sup>. Data also indicated that 28.1% of students aged 13 to 17, 22.1% aged 13 to 15 and 38.9% aged 16 and 17 years consume alcohol, highlighting the transition in the beginning to mid-adolescence as a critical period for this practice<sup>24</sup>.

Although socioeconomic status did not show statistical significance with alcohol consumption, most adolescents who participated in this research had a low socioeconomic status (44.05%), reflecting the Brazilian reality, with the highest concentration of alcohol consumption occurring in low socioeconomic classes<sup>25</sup>.

In relation to color/race, it was observed that alcohol use was higher among self-reported Black students, which has been corroborated by other findings that showed higher prevalence of alcohol consumption in this population<sup>26</sup>. On the other hand, there are reports regarding lower rates of alcohol use in this racial group<sup>27</sup>. Black adolescents are more likely to start using alcohol at older ages and are less likely to continue this use during their youth<sup>28</sup>. These results may be associated with greater difficulty in obtaining alcohol, which reduces the risk of early use and contributes to reduced consumption<sup>27</sup>.

Although the relationship between alcohol and occupational status has not been broadly studied, a study carried out in Brazil showed more frequent use among young people who had paid work<sup>29</sup>, similar to the findings of the present study. In this context, an important association was observed between financial resources availability and a greater prevalence of excessive episodic alcohol consumption, and regular risky consumption among professionally employed young people<sup>30</sup>.

Marital status has shown to play an important role in alcohol consumption in this study. An investigation revealed that teenagers who dated during elementary and high school are twice as likely to get involved with alcohol<sup>31</sup>. It is noteworthy mentioning that the relationship between dating and alcohol use in adolescence has been strongly associated with the construction of abusive relationships<sup>32</sup>.

Analyzing students in the 15 to 18 years age group, this study has found a positive correlation between alcohol consumption while dating and emotional and verbal violence, and threatening behaviors<sup>33</sup>. Other previous findings also showed physical and sexual aggression as one of the problems arising from the use of alcohol by minors<sup>32</sup>, confirming the hypothesis that adolescents who use alcohol are engaged in more violent attitudes<sup>33</sup>.

Regarding binge drinking, that is characterized by the consumption of five or more doses of alcohol on a single occasion<sup>30</sup>, the prevalence of 19% found in this study was higher than the observed in another Brazilian study (8.1%)<sup>34</sup> and worldwide (13.6%)<sup>6</sup>. These data show the impact of excessive alcohol use in adolescence as being an important global health problem, with serious consequences, such as cognitive impairment, anxiety, anguish, depression, and increased risk of alcohol dependence in adulthood, among others<sup>8,24,35</sup>.

In view of these findings, considering the vulnerability of some adolescents regarding alcohol use, as well as possible prevention and coping strategies, some possibilities are presented in the literature, including programs implementation in the school environment, such as classes focusing on the development of socio-emotional skills, which have an impact on reducing alcohol experimentation among adolescents<sup>36</sup>. Furthermore, informal conversations between peers, conducted in schools by the students themselves, can also help preventing harmful behaviors, including alcohol consumption<sup>37</sup>.

Such considerations reinforce the importance of adopting preventive policies, capable of preventing or delaying the onset of alcohol consumption among adolescents, in addition to preventing them from becoming more common and intense consumers in adulthood. In this sense, the present investigation brings important contributions by identifying the most vulnerable adolescents to alcohol use, for whom actions should be prioritized.

### Study limitations

This study has some limitations that must be addressed, such as its transversal design, which makes it difficult to establish a temporal relationship between cause and effect. Therefore, new investigations, with a prospective approach, are warranted, in addition to evaluating interventions that minimize alcohol use among adolescents.

### CONCLUSION

The prevalence of alcohol use among adolescents was 32.97%, and was influenced by age, racial characteristics, affective state and paid activity. Identifying adolescents with such characteristics can favor tailoring prevention strategies.

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Conceptualization, L.C.C., B.L.R.C. and A.S.T.; methodology, L.C.C., A.S.T. and C.A.N.; software, L.C.C.; validation, L.C.C., A.S.T. and C.A.N.; formal analysis, L.C.C., A.S.T. and C.A.N.; investigation, L.C.C.; resources, L.C.C.; data curation, L.C.C. and A.S.T.; manuscript writing, L.C.C. and B.L.R.C.; writing – review and editing, L.C.C., B.L.R.C. and C.A.N.; visualization, A.S.T. and C.A.N.; supervision, C.A.N.; project administration, L.C.C. All authors read and agreed with the published version of the manuscript.