

Alcohol Consumption Among High School and Technological Adolescents During the COVID-19 Pandemic: Observational, Cross-Sectional Study

Consumo de Álcool Entre Adolescentes do Ensino Médio e Tecnológicos Durante a Pandemia de COVID-19: Estudo Observacional, Transversal

Consumo de Alcohol entre Adolescentes de Secundaria y Tecnológicos Durante la Pandemia de COVID-19: Estudio Observacional, Transversal

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Abstract

Introduction: Harmful alcohol use is a significant public health issue, associated with an 8.4% increased risk of developing diseases. Method: Observational, cross-sectional study conducted in Maranhão, Brazil, between 2021 and 2022, involving 342 adolescents, using the *Alcohol Use Disorders Identification Test (AUDIT)*. Results: Higher alcohol consumption was observed among adolescents over 16 years old, female, Black, enrolled in the 3rd year of high school, living in masonry houses with up to five residents, with unemployed guardians, receiving government assistance, and with household income above the minimum wage. Discussion: An increase in alcohol consumption among girls has been documented in studies over the past decade. Early onset and growing prevalence of substance use among adolescents pose a concern for public health and require targeted attention from women's health programs. Conclusion: Although there is no consensus on whether alcohol consumption increased or decreased during the COVID-19 pandemic, a high prevalence was observed among female adolescents, regardless of age group.

Keywords: adolescent, mental health, underage drinking, alcohol-induced disorders

Resumo

Introdução: O uso nocivo do álcool é um importante problema de saúde pública, associado ao aumento de 8,4% no risco de doenças. Método: Estudo observacional e transversal realizado no Maranhão, entre 2021 e 2022, com 342 adolescentes, utilizando o Teste de Identificação de Transtornos por Uso de Álcool (*AUDIT*). Resultados: O consumo de álcool foi mais frequente entre adolescentes com mais de 16 anos, do sexo feminino, negros, cursando o 3º ano do ensino médio, residentes em casas de alvenaria, com até cinco moradores, responsáveis desempregados, beneficiários de auxílio governamental e com renda familiar acima de um salário mínimo. Discussão: O aumento do consumo de álcool entre meninas tem sido evidenciado em estudos da última década. O início precoce e a crescente prevalência do uso de substâncias entre adolescentes representam um desafio para a saúde pública, exigindo atenção específica dos programas voltados à saúde da mulher. Conclusão: Embora não haja consenso sobre o impacto da pandemia da COVID-19 no consumo de álcool, observa-se uma alta prevalência entre adolescentes do sexo feminino, independentemente da faixa etária.

Palavras-chave: adolescentes, saúde mental, consumo de álcool por menores, transtornos induzidos por álcool

Resumen

Introducción: El consumo nocivo de alcohol representa un importante problema de salud pública, asociado a un aumento del 8,4% en el riesgo de desarrollar enfermedades. Método: Estudio observacional y transversal realizado en Maranhão, Brasil, entre 2021 y 2022, con la participación de 342 adolescentes, utilizando el *Test de Identificación de Trastornos por Consumo de Alcohol (AUDIT)*. Resultados: Se observó un mayor consumo de alcohol entre adolescentes mayores de 16 años, de sexo femenino, afrodescendientes, que cursaban el tercer año de secundaria, que vivían en casas de mampostería con hasta cinco personas, con responsables desempleados, que recibían asistencia gubernamental y con ingresos familiares superiores al salario mínimo. Discusión: El aumento del consumo de alcohol entre las adolescentes ha sido evidenciado en estudios de la última década. El inicio temprano y la creciente prevalencia del uso de sustancias en esta población representan un desafío para la salud pública y requieren atención específica de los programas de salud de la mujer. Conclusión: Aunque no existe un consenso sobre el impacto de la pandemia de COVID-19 en el consumo de alcohol, se observó una alta prevalencia entre las adolescentes, independentemente del grupo etario.

Palabras clave: adolescentes, salud mental, consumo de alcohol en menores, trastornos inducidos por alcohol

Introduction

During adolescence, physical and psychological changes occur that mark the transition from puberty to adulthood (Terra Júnior et al., 2021). The presence of protective factors influences moral and social development, since the social group can pose a risk for negative experiences (Zeitoune et al., 2012). Additionally, hormonal conflicts and the search for new experiences increase vulnerability to alcohol consumption (Terra Júnior et al., 2021).

Alcohol abuse is associated with millions of deaths worldwide (World Health Organization, 2017). In 2017, global alcohol consumption was estimated at 6.2 liters per person aged 15 years or older, with alcohol being the most commonly used psychoactive substance among adolescents (World Health Organization, 2017; Benincasa et al., 2018). In 2019, 2.6 million deaths were attributed to its consumption. According to the World Health Organization (2024), alcohol accounted for 5.5% of all deaths in the Americas and 6.7% of all disability-adjusted life years. Additionally, 8.2% of the population over the age of 15 has an alcohol use disorder.

During the COVID-19 pandemic, alcohol consumption increased compared to previous years, despite the closure of bars and restaurants (Adamoli et al., 2020). This growth has been attributed to changes in routine, social distancing, stress, emotional instability, grief, future uncertainties, and financial problems (Rehm et al., 2020; Willsher, 2020; Ministry of Health, 2020).

Starting from this context of alcohol use among adolescents, the following guide question of the study emerged: What is the prevalence and factors associated with alcohol consumption among adolescents enrolled in basic education during the social isolation caused by the COVID-19 pandemic? Thus, the aim of this study was to evaluate the consumption of alcoholic beverages among high school/technological adolescents during the COVID-19 pandemic.

Method

This is an observational, cross-sectional study, developed on three campuses of the Federal Institute of Maranhão, located in Imperatriz, Barra do Corda and Coelho Neto. The study population consisted of adolescents and the sample size was determined by calculating finite populations, and a sample of 334 students was required:

$$n = \frac{2.507 \times 0,50 \times 0,50 \times (1,96)^2}{0,50 \times 0,50 \times (1,96)^2 + (2.507) \times 0,05^2} \cong 334$$

Adolescents aged 14 to 18 years, attending remote or in-person classes in the morning and afternoon shifts, were included, excluding those without internet access, as the study was conducted virtually. Data collection took place from November 2021 to May 2022 via Google Forms, with the link sent through class group chats via instant messaging. On the initial page of the questionnaire, there was an Informed Assent Form (IAF), and only after both the adolescent's assent and the legal guardian's authorization could the participant proceed to the questionnaire stage. In the case of adolescents aged 18 years, after accepting to participate in the research, with the click on "accept" in the Informed Consent Form (ICF) the system granted access to the questionnaire stage.

The research was regulated by Resolution No. 466/12 of the National Health Council (CNS) and was approved by the Research Ethics Committee of the Federal University of Piauí (UFPI) (Opinion No. 4,118,472).

The survey link was sent to WhatsApp groups, institutional emails, and social media of each school. In each unit, a staff member from the student affairs coordination disseminated the link and invited the adolescents, following prior briefing about the study. The questionnaire was divided into two categories. The first contained questions developed by the researchers and addressed sociodemographic and economic aspects, including variables such as age, ethnicity, sex, education level, housing conditions, number of people living in the household, monthly income, and employment status. The second category focused on alcohol consumption.

To identify the pattern of alcohol consumption during social isolation, the AUDIT—a quick and specific instrument (81% accuracy) for detecting harmful use, validated in Brazil and other countries—was applied (Silva et al., 2019).

The risk in this study was the possible identification of participants through their responses; however, anonymity was ensured by not allowing names to be provided. To avoid influence from parents or guardians, students were instructed to respond without third parties present and to submit the form immediately to block further access. External participation was also prevented, as the form required an institutional email for access.

Data were double-entered for error correction, organized in Excel, and analyzed using SPSS version 20. The sample was characterized by descriptive statistics, including means, standard deviations, and absolute and relative frequencies. Normality was assessed using the Kolmogorov-Smirnov test. Associations were evaluated by odds ratios (OR) with 95% confidence intervals. Logistic regression was used to analyze relationships between variables, with a significance level set at 0.05.

In the analysis of data on alcohol consumption, the variable "used at least once" was considered for affirmative responses, regardless of the reported frequency, and the variable "never used" was considered for negative responses.

Results

Out of 2,507 adolescents enrolled across three campuses, 344 participated; after excluding 2 incomplete questionnaires, the final sample comprised 342 participants. To describe the sample, absolute and relative frequencies were used for qualitative variables, and mean \pm standard deviation (SD) for quantitative variables. The Kolmogorov-Smirnov test assessed normality. In bivariate analysis, Pearson's chi-square test, Fisher's exact test, Mann-Whitney U test for two categories, and Kruskal-Wallis test for three or more categories were applied.

To identify factors associated with alcohol consumption, binary logistic regression was performed, presenting crude odds ratios (OR) with 95% confidence intervals. Data were entered into Excel and analyzed using SPSS version 20, with a significance level set at $p < 0.05$.

Most participants were under 16 years old (179; 52.3%). Females predominated (223; 62.3%) over males (129; 37.7%). Regarding ethnicity, 255 (74.6%) self-identified as Brown, 56 (16.4%) as White, 28 (8.2%) as Black, 2 (0.6%) as Indigenous, and 1 (0.3%) as Yellow-skinned.

Regarding the school year, 113 (33%) were in the 1st year, 105 (30.7%) in the 2nd year, and 124 (36.3%) in the 3rd year of high school. Most participants (324; 94.7%) lived in masonry houses, 1 (0.3%) in a stilt house, 4 (1.2%) in an apartment building, and 13 (3.8%) in a wattle and daub house. Regarding the employment status of the head of household, 185 (54.1%) were employed, 61 (17.8%) held informal jobs, 72 (21.1%) were unemployed but received

government assistance, and 24 (7%) were unemployed without assistance. Household income varied among participants: 116 (33.9%) reported earning up to one minimum wage, 115 (33.6%) reported earning more than one minimum wage, 97 (28.4%) stated they earned less than one minimum wage, and 14 (4.1%) reported having no income at all.

Regarding the frequency of alcohol consumption, 108 (31.6%) reported drinking at least once and 234 (68.4%) stated that they did not consume. In reference to the amount of alcoholic beverage on a normal day, 107 (31.3%) entered the variable "used at least once" and 235 (68.7%) in "never used". When asked about the frequency of consumption of six drinks or more on a single occasion, 63 (18.4%) entered the variable "used at least once" and 279 (81.6%) in "never used".

Regarding difficulty in stopping drinking, 13 (3.8%) reported having experienced it, while 329 (96.2%) did not. Concerning failure to complete daily tasks due to alcohol, 11 (3.2%) reported difficulties, whereas 331 (96.8%) did not. Regarding drinking early in the day to "cure" a hangover, 9 (2.6%) reported having done so, and 333 (97.4%) did not. Additionally, 32 (9.4%) reported forgetting events from the previous day due to alcohol consumption, compared to 310 (90.6%) who did not.

Regarding feeling guilty about drinking, 28 (8.2%) answered yes and 314 (91.8%) no. Concerning concern from family members or professionals due to abusive alcohol behavior, 7 (2%) reported it had occurred, while 335 (98%) did not. Finally, 22 (6.4%) stated they had injured themselves or others because of alcohol consumption, whereas 320 (93.6%) denied this (Table 1).

Table 1

Distribution of Frequencies of Alcohol Consumption Collected by the AUDIT Questionnaire. Teresina-PI, Brazil, 2022

Variables	At least 1x	I've never used
How often do you consume alcohol-containing beverages?	108 (31,6)	234 (68,4)
When you drink, how many alcohol-containing drinks do you consume on a normal day?	107 (31,3)	235 (68,7)
How often do you drink six drinks or more on a single occasion?	63 (18,4)	279 (81,6)
In the last 12 months, how often did you realize you couldn't stop drinking after you started?	13 (3,8)	329 (96,2)
In the last 12 months, how often have you not been able to perform the tasks you usually require for drinking?	11 (3,2)	331 (96,8)
In the last 12 months, how often did you have to drink first thing in the morning to "cure" a hangover?	9 (2,6)	333 (97,4)
In the last 12 months, how often have you felt guilty or remorseful about drinking?	28 (8,2)	314 (91,8)
In the last 12 months, how often did you not remember what happened the night before because you drank?	32 (9,4)	310 (90,6)
Have you ever expressed concern for your alcohol consumption or suggested that you stop drinking?	7 (2,0)	335 (98,0)
Have you ever been hurt or has anyone been hurt that you drank?	22 (6,4)	320 (93,6)

According to the AUDIT score, 314 (91.8%) adolescents were in Zone I, indicating the need for primary intervention; 20 (5.9%) were in Zone II, requiring basic guidance; 2 (0.6%) were in Zone III, recommending brief intervention and follow-up; and 6 (1.8%) were in Zone IV, indicating referral to specialized services.

Comparison of the Pattern of Alcohol Consumption With the Sociodemographic and Economic Profile of Adolescents

Alcohol consumption was significantly higher among adolescents over 16 years old (mean = 2.57; SD = 4.14; $p < 0.001$) and among those in the 3rd year of high school (mean = 2.57; SD = 4.13; $p < 0.001$). Higher mean consumption was also observed among female adolescents (mean = 2.03; SD = 3.95; $p = 0.452$), Black adolescents (mean = 2.68; SD = 3.43; $p = 0.230$), those living in masonry houses (mean = 2.00; SD = 3.98; $p = 0.879$), and those living with more than five people (mean = 2.06; SD = 3.83; $p = 0.821$). Regarding socioeconomic status, higher consumption was found among adolescents whose guardians were employed (mean = 2.08; SD = 4.43; $p = 0.785$) and among those with a household income above one minimum wage (mean = 2.57; SD = 5.04; $p = 0.785$) (Table 2).

Table 2

AUDIT Scores by Adolescents' Sociodemographic and Economic Profile – Teresina, PI, Brazil, 2022

Variables	Alcohol use in the last 12 months- AUDIT Average \pm SD
Age	
Up to 16 years	1.44 \pm 3.63
More than 16 years	2.57 \pm 4.14
p-value ^a	<0,001
Sex	
Female	2.03 \pm 3.95
Male	1.88 \pm 3.87
p-value ^a	0,452
Ethnicity	
White	1.80 \pm 3.65
Black	2.68 \pm 3.43
Brown/indigenous/yellow	1.94 \pm 4.02
p-value ^b	0,230
School year	
1st year of high school	1.28 \pm 3.61
2nd year of high school	2.02 \pm 3.88
3rd year of high school	2.57 \pm 4.13
p-value ^b	<0,001
Type of housing	
Masonry house	2.00 \pm 3.98
Other	1.56 \pm 2.48
p-value ^a	0,879
They live in the house	

Alcohol use in the last 12 months- AUDIT	
Variables	Average \pm SD
Between 2 and 5 people	1.96 \pm 3.93
More than 5 people	2.06 \pm 3.83
p-value ^a	0,821
Income	
More than one salary	2.57 \pm 5.04
Income less than a salary	2.06 \pm 3.74
No income	0.21 \pm 0.58
p-value ^b	0,155
Parent/Guardian employed	
Employed	2.08 \pm 4.43
Doing odd jobs	1.49 \pm 2.79
He's unemployed, but he gets government aid	2.25 \pm 3.68
Unemployed and no government assistance	1.58 \pm 2.59
p-value ^b	0,785

Note. a Mann-Whitney U test; b Kruskal-Wallis H test; SD = Standard Deviation.

Among the adolescents assessed using the AUDIT, 251 did not consume alcohol and 91 reported consumption. Among those who drank, the majority were older than 16 years ($n = 53$; 32.5%; OR = 1.79; 95% CI: 1.10–2.91), female ($n = 58$; 27.2%; OR = 1.09; 95% CI: 1.10–2.91), and Black ($n = 17$; 60.7%; OR = 1.96; 95% CI: 0.87–4.41). The highest consumption was observed among third-year high school students ($n = 43$; 34.7%; OR = 2.62; 95% CI: 1.42–4.86), those living in brick houses ($n = 89$; 27.5%; OR = 3.03; 95% CI: 0.68–13.44), and in households with up to five residents ($n = 78$; 26.9%; OR = 1.10; 95% CI: 0.56–2.18). Higher consumption was also observed among those whose guardians were employed ($n = 51$; 27.6%; OR = 1.90; 95% CI: 0.62–5.84) and whose household income was above one minimum wage ($n = 38$; 33.1%; OR = 6.42; 95% CI: 0.81–50.88) (Table 3).

Table 3

Alcohol Consumption According to the Sociodemographic and Economic Profile of the Students-AUDIT. Teresina-PI, Brazil, 2022

	Alcohol			
Variables	No (n=251)	Yes (n=91)	OR (_{95% CI})	p-value
	n (%)	n (%)		
Age				
Up to 16 years	141 (78,8)	38 (21,2)	1	0.025 ^a
More than 16 years	110 (67,5)	53 (32,5)	1,79 (1,10 - 2,91)	
Sex				
Female	155 (72,8)	58 (27,2)	1,09 (0,66 - 1,79)	0.835 ^a
Male	96 (74,4)	33 (25,6)	1	
Ethnicity				
White	40 (71,4)	16 (28,6)	1,21 (0,64 - 2,31)	0.241 ^a
Black	17 (60,7)	11 (39,3)	1,96 (0,87 - 4,41)	

	Alcohol			
Variables	No (n=251)	Yes (n=91)	OR (95% CI)	p-value
	n (%)	n (%)		
Brown/indigenous/yellow	194 (75,2)	64 (24,8)	1	
School year				
1st year of high school	94 (83,2)	19 (16,8)	1	0.008 ^a
2nd year of high school	76 (72,4)	29 (27,6)	1,88 (0,98 - 3,62)	
3rd year of high school	81 (65,3)	43 (34,7)	2,62 (1,42 - 4,86)	
Type of housing				
Masonry house	235 (72,5)	89 (27,5)	3,03 (0,68 - 13,44)	0.172 ^B
Other	16 (88,9)	2 (11,1)	1	
How many people live in the house				
Between 2 and 5 people	212 (73,1)	78 (26,9)	1,10 (0,56 - 2,18)	0,514
More than 5 people	39 (75,0)	13 (25,0)	1	
Income				
More than one salary	77 (67,0)	38 (33,0)	6,42 (0,81 - 50,88)	0.122 ^b
Income less than a salary	75 (77,3)	22 (22,7)	3,81 (0,47 - 30,79)	
No income	13 (92,9)	1 (7,1)	1	
Parent/Guardian is employed				
Employed	134 (72,4)	51 (27,6)	1,90 (0,62 - 5,84)	0.909 ^a
Doing odd jobs	47 (77,0)	14 (23,0)	1,50 (0,44 - 5,09)	
Unemployed, but receives government assistance.	50 (69,4)	22 (30,6)	2,20 (0,67 - 7,19)	
Unemployed and does not receive government assistance.	20 (83,3)	4 (16,7)	1	

Note. a Chi-square test; b Fisher's exact test; OR = Odds Ratio; 95% CI = 95% Confidence Interval.

Discussions

Some studies have reported an increase in alcohol consumption among adolescents during social isolation (Luca et al., 2020; Grigoletto et al., 2020; Ahmed et al., 2020), while others indicated a reduction before the pandemic (WHO, 2017; Pennay et al., 2018) and during the first six months of the COVID-19 pandemic (Pelham et al., 2021). Dumas et al. (2020) observed stability in the number of adolescents who consumed alcohol, but an increase in the frequency of use among girls.

The literature identifies alcohol as one of the most commonly used substances among adolescents (Jongenelis et al., 2019; Peltzer & Pengpid, 2021; Crane et al., 2021; Pelham, 2021), which is consistent with the findings of this study, showing a consumption rate of 26.6%. Alcohol abuse is considered a risk factor for the use of other drugs and is associated with absenteeism, poor academic performance, school failure, and dropout (Soares et al., 2019).

In this study, 108 adolescents (31.6%) consumed alcohol at least once in the past year, and 63 (18.4%) consumed six or more drinks on a single occasion. This excessive consumption, known as binge drinking, is common among individuals aged 12 to 17 (White, 2020; Alcover, 2021) and is associated with polysubstance use, influenced by lack of family and peer support, weak parental bonds, school dropout (Rodzlan Hasani, 2021), sociodemographic fac-

tors, low income (Halladay et al., 2020), anxiety, and depression (Williams et al., 2021).

The scientific literature has shown growing concern regarding alcohol consumption among adolescents, especially when related to contexts of social and emotional vulnerability. A bibliometric study analyzing publications on the topic between 1973 and 2022 highlighted a strong correlation between substance use and mental health issues such as anxiety, depression, and suicidal behavior (Costa & Silva-Júnior, 2024).

Adolescents who begin drinking alcohol at an early age tend to experiment with other substances rather than reduce use over time (Choi et al., 2018; Merrin et al., 2018). In this study, the consumption of six or more drinks was more frequent among those over 16 years old and 3rd-year high school students, confirming that this practice is more common in late adolescence (Peltzer & Pengpid, 2021; Rodzlan Hasani, 2021; Choi et al., 2018).

Among the adolescents, 20 (5.85%) required basic guidance, 2 (0.58%) brief intervention, and 6 (1.75%) referral to specialized services. According to Campollo et al. (2018), early identification of mental health problems related to substance use is essential for appropriate referral.

This study revealed higher alcohol consumption among female adolescents, a phenomenon already observed in recent investigations on substance use patterns between genders over the past decade (Horta et al., 2007; Malbergier et al., 2012; Ferreira & Machado, 2013; Jackson et al., 2016; Peltier et al., 2019; Malta et al., 2021; Malta et al., 2022; Obeid et al., 2022; Freitas et al., 2023; Costa et al., 2024; Ramos et al., 2024).

Although historically alcohol consumption has been higher among men, this difference has decreased, resulting in similar patterns between the sexes (Nadaleti et al., 2018; Mohale & Mokwena, 2020). Binge drinking is more common among men but has also increased among women between 2006 and 2018 (Merrin et al., 2018; McKetta & Keyes, 2019).

The change in women's social roles may contribute to this increase due to overload, stress, reduced stigmas, and access to spaces previously dominated by men (Sanchez et al., 2020; Haighton et al., 2018; Andrade, 2021). Early initiation and growth in consumption are concerning for public health and should be a focus of women's health programs, as biologically they are more sensitive to the effects of drugs (Andrade, 2021).

In this study, a higher frequency of alcohol consumption was observed among Black adolescents, a trend also identified in other epidemiological investigations. In the Brazilian context, adolescents aged 15–17 who self-identified as Black or Brown are approximately 60% more likely to engage in binge drinking (Medeiros et al., 2022).

The Black population is the most affected by alcohol-attributable deaths in Brazil, according to the report *Alcohol and the Health of Brazilians: Panorama 2024* by CISA. In 2022, the alcohol-attributable mortality rate was 10.4 per 100,000 inhabitants among Black individuals, compared to 7.9 among Whites, approximately 30% higher. These data highlight the unequal impact of alcohol consumption among White, Black, and Brown populations, evidencing the vulnerability of the Black population (Andrade, 2024).

Structural racial inequalities in Brazil exacerbate the impacts of alcohol consumption on the Black population. Limited access to healthcare, education, and housing, combined with structural racism and socioeconomic vulnerability, hinders treatment and intensifies the harmful effects of alcohol in this group (Andrade, 2024; Batista & Kalckmann, 2021).

This study found that alcohol consumption was more frequent among adolescents with

family income above one minimum wage, which means that the higher socioeconomic condition contributes to drug use, due to the resources for purchasing the product (Reis & Oliveira, 2015; Lu et al., 2015; Jackson et al., 2016).

The cross-sectional design limits the identification of causal relationships between substance use and the variables analyzed. Convenience sampling compromises representativeness and may introduce biases, especially due to the small sample size. Virtual data collection, necessary because of remote learning, may have hindered participation of students with limited access to electronic devices, affecting the sample composition.

Additionally, the higher number of female participants, combined with the absence of homogeneity testing between groups, may have influenced the findings related to the increase in alcohol consumption among women. These factors highlight the need for studies using probabilistic sampling, with balanced gender distribution, to allow for greater generalizability of the findings and better control of potential biases, particularly in the post-COVID-19 pandemic context.

Finally, it is important to note that the data were obtained exclusively from adolescents enrolled in school, which may limit the extrapolation of results to out-of-school youth, especially regarding patterns of polysubstance use.

Conclusion

A high rate of alcohol consumption was observed among women, a finding frequently reported in recent studies indicating that alcohol use among women is increasing and approaching or matching that of men, regardless of age group. However, the association between ethnicity and alcohol consumption in this study differs from other scientific evidence, indicating that it is not coherent to classify being Black as a risk factor for alcohol use. This highlights the need for collaborative longitudinal studies on a global scale to deepen the understanding of this issue and to inform public policies on prevention and health education. Such efforts are essential to strengthen strategies for preventing alcohol use and related diseases in adolescents, taking into account the specific patterns of psychoactive substance use in this age group.

Given the findings, significant knowledge gaps remain regarding the impact of the COVID-19 pandemic on adolescent alcohol use. The current body of evidence presents a mixed picture—some studies report a decrease in substance use, others an increase, and some suggest varied effects. In this context, the results of this study contribute to the ongoing discourse and enhance the understanding of the topic.

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References

Adamoli, A. N., Rittmann, I., Previdelli, J. F. A., Carvalho, J. R., Markus, J., Szupczynski, K. P. D. R., Sartes, L. M. A., Junior, L. R. B., Piccolo, M. B., Hayasida, N. M. A. & Zanon, R. B.

- (2020). *O uso de álcool e outras drogas em tempos de pandemia*. PUCRS. https://www.pucrs.br/coronavirus/wp-content/uploads/sites/270/2020/08/2020_08_24-coronavirus-cartilhas-psicovida-o_uso_de_alcool_e_outras_drogas_em_tempos_de_pandemia.pdf
- Ahmed, M. Z., Ahmed, O., Aibao, Z., Hanbin, S., Siyu, L., & Ahmad, A. (2020). Epidemic of COVID-19 in China and associated psychological problems. *Asian journal of psychiatry*, 51, 102092.
- Alcover, K. C., Lyons, A. J., Oluwoye, O., Muse, I. D., Kelly, M. E., & McDonell, M. G. (2021). Onset of alcohol use disorder among alcohol initiates by race/ethnicity. *Alcohol*, 97, 13–21.
- Andrade, A. G. (2021). *Álcool e a saúde dos brasileiros: Panorama 2021*. Centro de Informações sobre Saúde e Álcool (CISA).
- Andrade, A. G. (Org.). (2024). *Álcool e a saúde dos brasileiros: Panorama 2024* (6ª ed.). Centro de Informações sobre Saúde e Álcool (CISA). https://cisa.org.br/images/upload/Panorama_Alcool_Saude_CISA2024.pdf
- Batista, L. E., & Kalckmann, S. (2021). Racismo estrutural e saúde da população negra no Brasil. *Saúde em Debate*, 45(spe3), 11–23. <https://doi.org/10.1590/0103-11042021E301>
- Benincasa, M., Tavares, A. L., Barbosa, V. M. M., de Paula Lajara, M., Rezende, M. M., Heleno, M. G. V., & Custódio, E. M. (2018). The influence of relationships and alcohol use by adolescents. *SMAD, Revista Electrónica en Salud Mental, Alcohol y Drogas*, 14(1), 5–11.
- Campollo, O., Sheikhattari, P., Alvarez, C., Toro-Guerrero, J., Avila, H. S., & Wagner, F. A. (2018). Factors associated with tobacco, alcohol, and other drug use among youth living in West Central Mexico. *World Journal of Psychiatry*, 8(1), 33.
- Choi, H. J., Lu, Y., Schulte, M., & Temple, J. R. (2018). Adolescent substance use: Latent class and transition analysis. *Addictive behaviors*, 77, 160–165.
- Costa, E. S. da, Calheiros, P. R. V., & Farias, E. dos S. (2024). Consumo de álcool e sintomas de depressão, ansiedade e estresse em mulheres. *SMAD – Revista Eletrônica Saúde Mental, Álcool e Drogas* (Edição em Português), 20, e-200807. <https://doi.org/10.11606/issn.1806-6976.smad.2024.200807>
- Costa, G. O. P., & Silva-Júnior, F. L. (2024). Análise da produção científica sobre o consumo de álcool e outras drogas entre adolescentes: Um estudo bibliométrico de dados de 1973 a 2022. *RECIIS – Revista Eletrônica de Comunicação, Informação & Inovação em Saúde*, 18(3), 673–694. <https://doi.org/10.29397/reciis.v18i3.3679>
- Crane, N. A., Langenecker, S. A., & Mermelstein, R. J. (2021). Risk factors for alcohol, marijuana, and cigarette polysubstance use during adolescence and young adulthood: A 7-year longitudinal study of youth at high risk for smoking escalation. *Addictive behaviors*, 119, 106944.
- Dumas, T. M., Ellis, W., & Litt, D. M. (2020). What does adolescent substance use look like during the COVID-19 pandemic? Examining changes in frequency, social contexts, and pandemic-related predictors. *Journal of Adolescent Health*, 67(3), 354–361.
- Ferreira, S. C., & Machado, R. M. (2013). Equipe de saúde da família e o uso de drogas entre adolescentes. *Cogitare Enfermagem*, 18(3), 482–489.
- Freitas, M. G., Stopa, S. R., & Silva, E. N. (2023). Consumption of alcoholic beverages in Brazil: Estimation of prevalence ratios – 2013 and 2019. *Revista de Saúde Pública*, 57, 17. <https://doi.org/10.11606/s1518-8787.2023057004380>

- Grigoletto, V., Cognigni, M., Occhipinti, A. A., Abbracciavento, G., Carrozzi, M., Barbi, E., & Cozzi, G. (2020). Rebound of severe alcoholic intoxications in adolescents and young adults after COVID-19 lockdown. *Journal of Adolescent Health, 67*(5), 727–729.
- Haighton, C., Kidd, J., O'Donnell, A., Wilson, G., McCabe, K., & Ling, J. (2018). 'I take my tablets with the whiskey': A qualitative study of alcohol and medication use in mid to later life. *PLoS One, 13*(10), e0205956.
- Halladay, J., Woock, R., El-Khechen, H., Munn, C., MacKillop, J., Amlung, M., Ogrodnik, M., Favotto, L., Aryal, K., Noori, A., Kiflen, M., & Georgiades, K. (2020). Patterns of substance use among adolescents: A systematic review. *Drug and alcohol dependence, 216*, 108222.
- Horta, R. L., Horta, B. L., Pinheiro, R. T., Morales, B., & Strey, M. N. (2007). Tabaco, álcool e outras drogas entre adolescentes em Pelotas, Rio Grande do Sul, Brasil: Uma perspectiva de gênero. *Cadernos de saúde pública, 23*(4), 775–783.
- Jackson, K. M., Merrill, J. E., Barnett, N. P., Colby, S. M., Abar, C. C., Rogers, M. L., & Hayes, K. L. (2016). Contextual influences on early drinking: Characteristics of drinking and nondrinking days. *Psychology of Addictive Behaviors, 30*(5), 566.
- Jongenelis, M., Pettigrew, S., Lawrence, D., & Rikkers, W. (2019). Factors associated with poly drug use in adolescents. *Prevention Science, 20*, 695-704.
- Terra Júnior, A. T., et al. (2021). Consumo de álcool e outras substâncias psicoativas entre universitários e a prática de binge drinking. *South American Sciences, 2*(2).
- Lu, S., Du, S., Hu, X., Zou, S., Liu, W., Ba, L., & Ma, G. (2015). Drinking patterns and the association between socio-demographic factors and adolescents' alcohol use in three metropolises in China. *International journal of environmental research and public health, 12*(2), 2037–2053.
- Luca, L., Ciubara, A. B., Fulga, I., Burlea, S. L., Terpan, M., & Ciubara, A. (2020). Social Implications for Psychiatric Pathology of Depressive and Anxiety Disorders, Alcohol Addiction and Psychotic Disorders during the COVID-19 Pandemic in Romania. Analysis of two Relevant Psychiatry Hospitals. *Revista de cercetare si interventie sociala, 69*.
- Malbergier, A., Cardoso, L. R. D., Amaral, R. A. D., & Santos, V. C. V. (2012). Gender parity and drug use: Are girls catching up with boys? *Brazilian Journal of Psychiatry, 34*, 16–23.
- Malta, D. C., Da Silva, A. G., Prates, E. J. S., Alves, F. T. A., Cristo, E. B., & Machado, Í. E. (2021). Convergence in alcohol abuse in Brazilian capitals between genders, 2006 to 2019: What population surveys show. *Revista Brasileira de Epidemiologia, 24*(Suppl 1), e210022. <https://doi.org/10.1590/1980-549720210022.supl.1>
- Malta, D. C., Silva, J. P., Santos, M. A., Oliveira, R. T., & Lima, F. S. (2022). Consumption of and exposure to alcoholic beverages among Brazilian adolescents: Evidence from the 2015 and 2019 National School Health Surveys. *REME – Revista Mineira de Enfermagem, 26*, e38495. <https://doi.org/10.35699/2316-9389.2022.38495>
- McKetta, S., & Keyes, K. M. (2019). Heavy and binge alcohol drinking and parenting status in the United States from 2006 to 2018: An analysis of nationally representative cross-sectional surveys. *PLoS Medicine, 16*(11), e1002954.
- Medeiros, P. F. P., Valente, J. Y., Rezende, L. F. M., & Sanchez, Z. M. (2022). Consumption of alcoholic beverages among Brazilian adolescents: Results from a national household survey. *Cadernos de Saúde Pública, 38*(12), e00077322. <https://doi.org/10.1590/1518-8786.202200077322>

- org/10.1590/0102-311XEN077322
- Merrin, G. J., Thompson, K., & Leadbeater, B. J. (2018). Transitions in the use of multiple substances from adolescence to young adulthood. *Drug and alcohol dependence*, 189, 147–153.
- Ministry of Health. (2020). *Guidelines on alcohol use during the COVID pandemic-19. Mental health and the COVID-19 pandemic*, 5, 1–11.
- Mohale, D., & Mokwena, K. E. (2020). Substance use amongst high school learners in the south of Johannesburg: Is this the new norm? *South African Family Practice*, 62(4).
- Nadaleti, N. P., Muro, E. S., De Carvalho, C. C., De Assis, B. B., Da Silva, D. M., & Chaves, E. D. C. L. (2018). Avaliação do consumo de álcool entre adolescentes e os problemas associados. *SMAD – Revista Eletrônica Saúde Mental Álcool e Drogas (edição em português)*, 14(3), 168–176.
- Obeid, S., Hallit, S., Sacre, H., & Salameh, P. (2022). Factors associated with the onset of smoking and alcohol consumption: A cross-sectional study among Lebanese adolescents in schools. *Archives de Pédiatrie*, 29(3), 194–199.
- Pelham, W. E., Tapert, S. F., Gonzalez, M. R., McCabe, C. J., Lisdahl, K. M., Alzueta, E., Baker, F. C., Breslin, F. J., Dick, A. S., Dowling, G. J., Guillaume, M., Hoffman, E. A., Marshall, A. T., McCandliss, B. D., Sheth, C. S., Sowell, E. R., Thompson, W. K., Rinsveld, A. M. V., Wade, N. E., & Brown, S. A. (2021). Early adolescent substance use before and during the COVID-19 pandemic: A longitudinal survey in the ABCD study cohort. *Journal of Adolescent Health*, 69(3), 390–397.
- Peltier, M. R., Verplaetse, T. L., & Mineur, Y. S. (2019). Sex differences in stress-related alcohol use. *Neurobiol Stress*, 10, 100149.
- Peltzer, K., & Pengpid, S. (2021). Polysubstance use among national samples of in-school adolescents in Tonga and Vanuatu. *Asian Journal of Psychiatry*, 65, 102819.
- Pennay, A., Holmes, J., Törrönen, J., Livingston, M., Kraus, L., & Room, R. (2018). Researching the decline in adolescent drinking: The need for a global and generational approach. *Drug and Alcohol Review*, 37, S115-S119.
- Ramos, F. P., Reis, L. B., Iglesias, A., Andrade, A. L., Gandra, C. T., & Costa, E. F. (2024). Consumption of drugs as an emotion regulation strategy during the Covid-19 pandemic [Consumo de drogas como estratégia de regulação emocional durante a pandemia de Covid-19]. *Psicologia em Pesquisa*, 18(3), e36131. <https://doi.org/10.34019/1982-1247.2024.v18.36131>
- Rehm, J., Kilian, C., Ferreira-Borges, C., Jernigan, D., Monteiro, M., Parry, C. D. H., Sanchez, Z. M., & Manthey, J. (2020). Alcohol use in times of the COVID 19: Implications for monitoring and policy. *Drug and alcohol review*, 39(4), 301–304.
- Reis, T. G. D., & Oliveira, L. C. M. D. (2015). Pattern of alcohol consumption and associated factors among adolescents students of public schools in an inner city in Brazil. *Revista Brasileira de Epidemiologia*, 18, 13–24.
- Rodzlan Hasani, W. S., Saminathan, T. A., Ab Majid, N. L., Miaw Yn, J. L., Mat Rifin, H., Abd Hamid, H. A., Lourdes, R. T. G., Ahmad, A., Ismail, H., Abd Rashid, R., & Mohd Yusoff, M. F. (2021). Polysubstance use among adolescents in Malaysia: Findings from the National Health and Morbidity Survey 2017. *Plos one*, 16(1), e0245593.

- Sanchez, Z. V. D. M., Konstantyner, T. C. R. D. O., Wagner, G. A., Monteiro, M. G., & Martins, C. B. (2020). Heavy episodic drinking trends in the Brazilian state capitals and Federal District, 2006-2018: An ecological time series analysis. *Epidemiologia e Serviços de Saúde*, 29, e2020078.
- Silva, M. D. G. B. D., Lyra, T. M., & Diniz, G. T. (2019). The pattern of alcohol consumption among the users of the Family Health Units in the municipality of Recife (PE). *Saúde em Debate*, 43, 836–847.
- Soares, F. R. R., Farias, B. R. F. D., & Monteiro, A. R. M. (2019). Consumption of alcohol and drugs and school absenteeism among high school students of public schools. *Revista Brasileira de Enfermagem*, 72, 1692–1698.
- White, A. M. (2020). Gender differences in the epidemiology of alcohol use and related harms in the United States. *Alcohol research: Current reviews*, 40(2).
- Williams, G. C., Patte, K. A., Ferro, M. A., & Leatherdale, S. T. (2021). Substance use classes and symptoms of anxiety and depression among Canadian secondary school students. *Chronic Diseases and Injuries in Canada*, 41(5)).
- Willsher, K. (2020). *Local officials have revoked an order banning sales of alcoholic drinks in a department in northern France*. The Guardian. <https://www.theguardian.com/world/live/2020/mar/26/coronavirus-live-news-update-world-lockdown-global-deaths-india-uk-us-australia-china-latest-updates>
- World Health Organization. (2017). Technical annex. Updated Appendix 3 of the WHO Global NCD Action Plan 2013-2020. https://cdn.who.int/media/docs/default-source/ncds/mnd/2022_discussion_paper_01_aug.pdf?sfvrsn=6aa03d21_3
- World Health Organization. (2024, Junho 28). *Alcohol*. <https://www.who.int/news-room/fact-sheets/detail/alcohol>
- Zeitoune, R. C. G., Ferreira, V. D. S., Silveira, H. S. D., Domingos, A. M., & Maia, A. C. (2012). Knowledge of teenagers about licit and illicit drugs: A contribution to community nursing. *Escola Anna Nery*, 16, 57–63.

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