

Brazilian Health Survey (2013): relation between alcohol use and sociodemographic characteristics by sex in Brazil

Pesquisa Nacional de Saúde 2013: relação entre uso de álcool e características sociodemográficas segundo o sexo no Brasil

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ABSTRACT: *Objective:* To analyze sociodemographic factors associated with alcohol use according to gender in Brazil. *Methods:* Cross-sectional study using data from 2013 Brazilian Health Survey about 60,202 adults. We analyzed recent alcohol use and heavy episodic drinking in the 30 days prior to the research stratified by gender. The covariates were: age, educational level, skin color, marital status, and place of residence. *Results:* The prevalence of recent alcohol use was 26.5%. In women, the prevalence was 14.4%; in men, 38.1%. In women, recent alcohol use was associated with younger age, higher educational level, being single or separated/divorced, and living in urban areas. In men, there was association with white skin color in addition to these factors. Among adults who used alcohol, 51.5% reported heavy episodic drinking — in women, this proportion was 43.4%; in men, 55.0%. In women, heavy episodic drinking was associated with younger age, being single or separated/divorced and living in urban areas; white skin color and higher educational level had negative association with this pattern. In men, heavy episodic drinking was directly associated with younger age and being single or divorced and inversely to white skin color; there was no significant relation with education and place of residence. *Conclusion:* We observed that men consume more alcohol than women. There is a convergence of alcohol consumption, including heavy episodic drinking, between men and women who are younger, single and divorced, and residents of urban areas. Skin color, educational level, and place of residence showed variations in the models by sex.

Keywords: Epidemiology. Alcohol drinking. Binge drinking. Socioeconomic factors.

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RESUMO: *Objetivo:* Analisar fatores sociodemográficos associados ao uso de álcool segundo o sexo no Brasil. *Métodos:* Estudo transversal com dados provenientes da Pesquisa Nacional de Saúde, de 2013, sobre 60.202 adultos. Analisou-se o uso recente e o uso episódico excessivo de álcool nos 30 dias anteriores à pesquisa segundo sexo. As covariáveis foram: idade, escolaridade, cor da pele, estado civil e local de residência. *Resultados:* A prevalência de uso recente de álcool foi de 26,5%, sendo 14,4% em mulheres e 38,1% em homens. O uso recente de álcool entre as mulheres foi associado às variáveis idade jovem, maior escolaridade, estar solteira ou separada/divorciada e viver em área urbana. Em homens, além dos fatores supracitados, houve associação com a cor da pele branca. Dos indivíduos que usaram álcool, 51,5% relataram uso episódico excessivo — entre as mulheres, a proporção foi 43,4%; entre os homens, 55,0%. Nas mulheres, o uso episódico excessivo de álcool esteve associado à idade jovem, estar solteira ou separada/divorciada e viver em área urbana; cor branca e ter ensino superior tiveram associação inversa com esse padrão. Em homens, o uso episódico excessivo de álcool esteve diretamente associado à idade jovem e a estar solteiro ou separado/divorciado, e inversamente à cor branca; não houve relação significativa com escolaridade e local de residência. *Conclusão:* Observou-se que os homens consomem mais álcool. Porém, constatou-se uma convergência do consumo de álcool, incluindo o uso episódico excessivo, entre homens e mulheres mais jovens, solteiros(as) e divorciados(as) e residentes de área urbana. Cor de pele, escolaridade e local de residência mostraram variações nos modelos entre sexos.

Palavras-chave: Epidemiologia. Consumo de bebidas alcoólicas. Bebedeira. Fatores socioeconômicos.

INTRODUCTION

The heavy use of alcoholic beverages is a relevant public health issue and it is one of the main five risk factors of death and disability in the world¹. The World Health Organization (WHO) estimates that 5.9% of all overall deaths happen due to alcohol every year. Its harmful use causes death and disability of relatively young people, resulting in the loss of many life years¹.

About half of the alcohol-related deaths occur due to noncommunicable diseases because of its chronic use, such as cancer, cardiovascular diseases, mental illnesses and liver cirrhosis^{1,2}. On the other hand, the acute and episodic alcohol use constitutes a risk factor for external causes, such as transportation and work accidents, violence, among others, especially among young men^{1,3}. American countries present a problem of larger magnitude than the overall average regarding the alcohol *per capita* consumption and the prevalence of heavy episodic use and of alcohol-related disorders, whereas European countries stay right behind them^{1,4}. Brazil overcomes the average of Americas regarding the annual consumption of pure alcohol per person aged 15 years and older¹, and the alcohol use in the country is the fourth risk factor of the overall disease burden⁵. The country is also in the top list of those presenting the highest mortality rates attributable to alcohol in Americas⁴, and faces the growth in the national standardized rate of mortality due to basic or alcohol-related causes, which changed from 12.3 deaths per 100,000 residents, in 2000, to 15.9 deaths per 100,000 residents, in 2013⁶ — a number that may still be underrated due to sub-recording^{4,6}.

In general, consumption and presence of alcohol-related disorders are higher among men than women, both national and internationally^{1,6-9}. In the year of 2012, 7.6% of the deaths among men were attributed to alcohol in comparison with 4.0% of deaths among women in the world¹. In addition, men presented a higher proportion of global burden of disease, which is expressed in years of potential life lost due to premature death and disability attributed to alcohol, than women — 7.4% in comparison with 2.3% in the female sex¹. Data of the Brazilian Mortality Information System (SIM) show that the rate of deaths due to alcohol use was 5.4 times, on average, higher for men than for women in the 2000-2013 period⁶.

Although differences are remarkable between sexes, alcohol use, especially heavy episodic drinking, has increased in women¹⁰. A survey from *Universidade Federal de São Paulo* (Unifesp) shows that among the non-abstinent population, the consumption of 5 or more doses of alcoholic beverages for men or 4 or more doses for women throughout a 12-month period increased 31.1% from 2006 to 2012, and women showed a growth of 36.0%¹¹. Thus, research on the differences of alcohol use between men and women are very important, because they support the identification of risk groups in the population and are also useful for formulating policies regarding damage prevention and reduction.

Studies show that the amount and standard of alcohol use vary in the Brazilian population according to factors such as age, ethnicity/skin color, socioeconomic condition and/or education, work, marital status, and neighboring characteristics. These factors may work differently between men and women^{9,12-15}. However, studies that provide a sex-stratified analysis published in Brazil^{9,12-15} present divergent results and do not have national scope, so the use of a sample with national representativeness is relevant.

Therefore, this study aims to analyze the sociodemographic factors associated with recent alcohol use and heavy episodic drinking according to sex in Brazil, by using a large sample.

METHODS

This is a cross-sectional study based on data from the 2013 Brazilian Health Survey (PNS). The PNS is a household national survey with the aim of producing data about the population's health condition, life styles and healthcare. It was carried out by the Brazilian Ministry of Health together with the Brazilian Institutes of Geography and Statistics (IBGE)¹⁶. It was a three-phase sampling. The census tracts were chosen in the first phase; the private households were chosen in the second; and an 18-year-old or older resident was chosen in the third phase. The total size of the 2013 PNS sample was 64,348 households¹⁶.

The sample used in the present study included 60,202 subjects aged older than 18 years distributed into 26 Brazilian states and in the District Federal in 2013. The average amount of observations per state was 2,229.7, but it varied from 1,332 in the state of Amapá to 5,305 in the state of São Paulo.

We used two outcomes associated with alcohol use and six sociodemographic variables obtained in the individual questionnaire, based on:

Outcomes

1. Recent alcohol use: consumption of alcoholic beverages in 30 days before the research, regardless of the amount.
2. Heavy episodic drinking: consumption of 5 or more doses (men) or 4 or more doses (women) in a single occasion at least once in 30 days before the research.

Sociodemographic characteristics

1. Sex: female, male.
2. Skin color: white — adults that self-report themselves as white and oriental; non-white — subjects that self-declare themselves as black- or brown-skinned and indigenous.
3. Age: 18 to 24 years; 25 to 34 years; 35 to 44 years; 45 to 54 years; 55 to 64 years; and 65 years or older.
4. Educational level: no instruction and incomplete elementary school; complete elementary school and incomplete high school; complete high school and incomplete upper school; complete upper school.
5. Marital status: single; married; separated/divorced; widowed.
6. Area of residence: rural; urban.

A descriptive analysis of the individual variables was performed through calculation of absolute and relative frequencies and, then, bivariate analyses were performed to assess the association between the outcomes and the sociodemographic characteristics by using Pearson's χ^2 test. The analyses of heavy episodic drinking were conducted in adults who reported alcohol use in 30 days before the research.

Prevalence ratios (PR) of recent alcohol use adjusted by all the other variables were calculated through multivariate Poisson regression, with an estimator of robust variance, considering non-use of alcohol in 30 days before the research as a reference. The same technique was used for the heavy episodic drinking; however, the model included only subjects who reported consuming alcohol in this period, while not reporting heavy episodic drinking was considered a reference.

The analyses were performed separately for men and women in the *Survey* module of the Stata 12 software that incorporates the complex sampling design used by the PNS.

The research fulfils the determinations of the Resolution 466/12 of the Brazilian Health Council (CNS) that established guidelines and standards for researches with human beings. The Research Ethics Committee of *Universidade Federal de Minas Gerais* (COEP/UFGM) approved this paper under protocol CAAE 40656515.9.0000.5149. The Research Ethics National Commission (CONEP) of CNS also approved the PNS under protocol CAAE 10853812.7.0000.0008.

RESULTS

The prevalence of recent alcohol use in Brazil was 26.5%, 39.2% for males and 15.2% for females in 2013. People that self-declared themselves as white-skinned, aged between

25 and 34, with complete upper school or graduation, single, and residents in urban areas had the highest rates of recent alcohol use (Table 1).

The prevalence of heavy episodic drinking in the population was 13.7%: 21.6% for males and 6.6% for females. Groups presenting the highest frequency of heavy episodic drinking were white-skinned, ages between 25 and 34, complete elementary school and incomplete high school, single and residents in urban areas (Table 1).

Among men, alcohol use in 30 days before the research was more frequent among white-skinned subjects, aged between 25 and 34, with upper educational level, separated or divorced and resident in rural areas. The same pattern was seen among women, but higher frequency of alcohol use was observed in the group of 18-24 years old, and the frequency among single and separated women was similar (Table 2).

The difference between prevalence of recent alcohol use among men and women was lower in the youngest ages. While recent alcohol use was 4.4 times more prevalent in the 65 and older age group in men compared to women in the ages of 18-25 age group, the prevalence among men was only 1.9 times higher. The differences also decrease with increase of the educational level and decrease among men who are single, separated and resident in urban areas (Table 2).

Considering only those who consumed alcohol in 30 days before the research, heavy episodic drinking was seen in 51.5% of the population: 55.0% for men and 43.4% for women. The prevalence of heavy episodic drinking was higher in non-white-skinned subjects in the ages of 25 and 34, followed by the ages of 18 and 24 years, with complete high school or higher educational level, in singles and residents in urban areas. The same pattern was seen among women, with the exception regarding the educational level, because the complete elementary school and incomplete high school level had higher frequency of heavy episodic drinking (Table 3).

Differences between men and women in the proportion of heavy episodic drinking decreased in the youngest ages, among single and separated men and residents in urban areas; it was even lower among the non-white skinned population and those with complete elementary school and incomplete high school, where the prevalence between men was 6% higher than among women (Table 3).

Men showed an association of recent alcohol use with white skin color, the ages of 25 to 64 years, and the ages of 25 to 34 presented the highest PR, complete elementary school to incomplete high school or complete upper school, being single or separated, and living in urban areas.

Among women, the ages between 18 and 64 presented association with alcohol use in comparison with the age of 65 or older ($p < 0.05$), and the ages of 18 to 25 years and 25 and 34 years had the highest PR. Increase of educational level, being single or separated, and living in urban areas were the factors associated with recent alcohol use. Skin color did not show a significant association in this group ($p = 0.55$) (Table 4).

Among men who consumed alcohol in 30 days before the research, white-skinned subjects presented lower heavy episodic drinking and all ages presented a significant

Table 1. Prevalence of recent alcohol use and heavy episodic drinking among adults according to sociodemographic characteristics, Brazilian Health Survey, Brazil, 2013.

Variables (n)	Total population		Non-use		Recent use ^a		Heavy episodic drinking ^b	
	%	95%CI	%	95%CI	%	95%CI	%	95%CI
Sex								
Male (25,920)	47.1	46.4 – 47.9	60.8	59.6 – 61.9	39.2	38.1 – 40.4	21.6	20.7 – 22.5
Female (34,282)	52.9	52.2 – 53.6	84.8	84.0 – 85.6	15.2	14.4 – 16.0	6.6	6.1 – 7.1
Skin color								
Non-white (35,563)	51.6	50.8 – 52.4	74.7	73.7 – 75.6	25.3	24.4 – 26.3	14.8	14.2 – 15.5
White (24,639)	48.4	47.6 – 49.2	72.2	71.1 – 73.2	27.8	26.8 – 28.9	12.4	11.7 – 13.2
Age (years)								
65 or older (7,712)	12.3	11.8 – 12.8	87.6	86.2 – 88.8	12.4	11.2 – 13.8	2.9	2.3 – 3.5
55 to 64 (7,681)	13.5	13.0 – 14.0	77.7	76.0 – 79.3	22.3	20.7 – 24.0	7.7	6.8 – 8.8
45 to 54 (10,246)	17.5	17.0 – 18.1	73.2	71.5 – 74.7	26.9	25.3 – 28.5	13.1	12.0 – 14.2
35 to 44 (12,817)	19.2	18.6 – 19.8	71.5	70.1 – 72.9	28.5	27.1 – 29.9	15.7	14.6 – 16.7
25 to 34 (13,923)	21.6	21.0 – 22.2	67.5	66.0 – 69.0	32.5	31.0 – 34.0	19.6	18.3 – 20.9
18 to 24 (7,823)	15.9	15.4 – 16.5	69.9	67.9 – 71.8	30.1	28.2 – 32.2	17.3	15.7 – 18.9
Educational level								
Until incomplete elementary school (24,083)	38.9	38.1 – 39.8	78.8	77.8 – 79.8	21.2	20.2 – 22.2	11.1	10.5 – 11.8
Complete elementary and incomplete high schools (9,215)	15.5	15.0 – 16.1	70.9	69.2 – 72.6	29.1	27.4 – 30.8	15.8	14.5 – 17.2
Complete high school and incomplete upper school (19,149)	32.8	32.1 – 33.5	71.4	70.1 – 72.6	28.6	27.4 – 29.9	15.4	14.4 – 16.3
Complete upper school (7,755)	12.7	12.0 – 13.5	65.7	63.8 – 67.6	34.3	32.4 – 36.3	14.3	12.9 – 15.9
Marital status								
Married (23,741)	44.3	43.5 – 45.1	76.6	75.6 – 77.6	23.4	22.5 – 24.4	9.9	9.3 – 10.6
Single (27,026)	42.5	41.8 – 43.3	68.2	67.1 – 69.3	31.8	30.7 – 32.9	18.9	18.0 – 19.8
Separated/ Divorced (4,727)	6.5	6.2 – 6.9	70.3	67.6 – 72.8	29.7	27.2 – 32.4	15.3	13.4 – 17.4
Widowed (4,708)	6.7	6.4 – 7.0	89.2	87.5 – 90.7	10.8	9.3 – 12.5	3.6	2.9 – 4.5
Area of residence								
Rural (49,245)	86.2	85.8 – 86.7	72.5	71.7 – 73.3	20.3	18.8 – 21.9	10.3	9.2 – 11.4
Urban (10,957)	13.8	13.3 – 14.3	79.7	78.1 – 81.2	27.5	26.7 – 28.4	14.2	13.6 – 14.8
Total (60,202)	100	–	73.5	72.7 – 74.2	26.5	25.8 – 27.3	13.7	13.1 – 14.2

^aConsumption of any amount of alcohol in 30 days before the research; ^bConsumption of 4 or more doses of alcohol for women and 5 or more doses of alcohol for men in a single occasion in 30 days before the research; 95%CI: 95% confidence interval.

Table 2. Prevalence of recent alcohol use among adults according to sex and sociodemographic characteristics, Brazilian Health Survey, Brazil, 2013.

Variables	Men					Women				
	Non-use		Recent alcohol use a ^a		p-value ^b	Non-use		Recent alcohol use a ^a		p-value ^b
	%	95%CI	%	95%CI		%	95%CI	%	95%CI	
Skin color										
Non-white	63.0	61.5 – 64.4	37.0	35.6 – 38.5	< 0,001	85.4	84.3 – 86.4	14.6	13.6 – 15.8	< 0,001
White	58.3	56.6 – 60.0	41.7	40.0 – 43.4		84.2	83.1 – 85.3	15.8	14.7 – 16.9	
Age (years)										
65 or older	78.0	75.3 – 80.6	22.0	19.4 – 24.7	< 0,001	95.0	93.8 – 96.0	5.0	4.0 – 6.2	< 0,001
55 to 64	64.1	61.2 – 66.9	35.9	33.1 – 38.9		89.2	87.4 – 90.9	10.8	9.1 – 12.6	
45 to 54	59.3	56.7 – 61.9	40.7	38.1 – 43.3		85.5	83.9 – 87.0	14.5	13.0 – 16.1	
35 to 44	57.3	55.0 – 59.6	42.7	40.4 – 45.0		83.8	82.3 – 85.1	16.2	14.9 – 17.7	
25 to 34	54.2	51.9 – 56.4	45.8	43.6 – 48.1		80.1	78.3 – 81.8	19.9	18.2 – 21.7	
18 to 24	60.5	57.7 – 63.3	39.5	36.7 – 42.3		79.0	76.3 – 81.4	21.0	18.6 – 23.7	
Educational level										
Until incomplete elementary school	65.8	64.1 – 67.4	34.2	32.6 – 35.9	< 0,001	90.9	90.1 – 91.7	9.1	8.3 – 10.0	< 0,001
Complete elementary and incomplete high schools	57.9	55.2 – 60.6	42.1	39.4 – 44.8		84.0	82.0 – 85.8	16.0	14.2 – 18.0	
Complete high school and incomplete upper school	59.0	57.0 – 61.0	41.0	39.0 – 43.0		82.0	80.6 – 83.3	18.0	16.7 – 19.4	
Complete upper school	52.2	49.1 – 55.2	47.8	44.8 – 50.9		75.6	73.3 – 77.8	24.4	22.2 – 26.8	
Marital status										
Married	64.7	63.1 – 66.2	35.3	33.8 – 36.9	< 0,001	88.3	87.3 – 89.2	11.7	10.8 – 12.7	< 0,001
Single	56.5	55.0 – 58.0	43.5	42.0 – 45.0		80.0	78.7 – 81.3	20.0	18.7 – 21.3	
Separated/divorced	55.7	51.0 – 60.2	44.3	39.8 – 49.0		79.9	76.8 – 82.6	20.2	17.4 – 23.2	
Widowed	74.4	68.8 – 79.3	25.6	20.8 – 31.2		92.8	91.1 – 94.2	7.2	5.8 – 8.9	
Area of residence										
Rural	67.8	65.5 – 69.9	32.3	30.1 – 34.5	< 0,001	92.3	90.9 – 93.4	7.7	6.6 – 9.1	< 0,001
Urban	59.5	58.3 – 60.8	40.5	39.2 – 41.7		83.7	82.8 – 84.6	16.3	15.4 – 17.2	
Total	60.8	59.6 – 61.9	39.2	38.1 – 40.4		84.8	84.0 – 85.6	15.2	14.4 – 16.0	

^aConsumption of any amount of alcohol in 30 days before the research; ^bp-value of Pearson's χ^2 test; 95%CI: 95% confidence interval.

Table 3. Rate of heavy episodic drinking among adults that drank alcohol^a according to sex and sociodemographic characteristics, Brazilian Health Survey, Brazil, 2013.

Variables	Total (n = 14,595)			Men (n = 9,683)			Women (n = 4,912)		
	%	95%CI	p-value ^b	%	95%CI	p-value ^b	%	95%CI	p-value ^b
Skin color									
Non-white	58.5	56.5 – 60.5	< 0.001	61.6	59.3 – 63.8	< 0.001	51.4	47.9 – 54.9	< 0.001
White	44.6	42.4 – 46.9		48.6	45.9 – 51.2		35.6	32.3 – 39.1	
Age (years)									
65 or older	23.0	18.8 – 27.8	< 0.001	26.0	20.7 – 32.0	< 0.001	12.8	8.3 – 19.1	< 0.001
55 to 64	34.5	30.6 – 38.7		37.4	32.7 – 42.4		26.4	20.0 – 34.0	
45 to 54	48.7	45.4 – 51.9		53.3	49.3 – 57.4		36.9	31.8 – 42.3	
35 to 44	54.9	52.1 – 57.7		59.2	55.7 – 62.5		45.1	40.7 – 49.7	
25 to 34	60.2	57.5 – 62.7		63.4	60.1 – 66.6		53.1	48.5 – 57.6	
18 to 24	57.2	53.3 – 61.1		62.2	57.4 – 66.8		48.1	42.2 – 54.2	
Educational level									
Until incomplete elementary school	52.5	50.0 – 55.0	< 0.001	55.2	52.3 – 58.0	0.01	43.4	38.9 – 48.0	< 0.001
Complete elementary and incomplete high schools	54.4	50.6 – 58.0		55.3	50.9 – 59.7		51.8	45.1 – 58.5	
Complete high school and incomplete upper school	53.6	51.2 – 56.1		57.5	54.4 – 60.4		46.2	42.2 – 50.2	
Complete upper school	41.8	38.2 – 45.4		48.2	43.5 – 53.0		32.5	28.0 – 37.4	
Marital status									
Married	42.4	40.2 – 44.7	< 0.001	45.9	43.3 – 48.5	< 0.001	32.2	28.5 – 36.3	< 0.001
Single	59.4	57.3 – 61.4		63.2	60.8 – 65.6		51.0	47.5 – 54.5	
Separated/divorced	51.4	46.3 – 56.4		54.2	47.3 – 60.8		47.4	39.4 – 55.5	
Widowed	33.2	26.8 – 40.2		41.4	31.2 – 52.5		26.1	18.9 – 34.9	
Area of residence									
Rural	50.5	46.7 – 54.3	0.614	53.6	49.5 – 57.7	0.49	36.9	29.7 – 44.7	0.09
Urban	51.6	49.9 – 53.2		55.2	53.3 – 57.1		43.8	41.2 – 46.4	
Total	51.5	49.9 – 53.0		55.0	53.2 – 56.7		43.4	40.9 – 45.8	

^aConsumption of 4 or more doses of alcohol for women and 5 or more doses of alcohol for men in a single occasion in 30 days before the research among those who consumed alcohol in this period; ^bp-value of Pearson's χ^2 test; 95%CI: 95% confidence interval.

association with the age of 65 or older ($p < 0.001$), and the ages 25 to 34 years are the ones with higher PR. Being single or separated presented low, yet significant, association, among men. The area of residence did not show association with this pattern of use in this group (Table 5).

White-skinned women and those with upper educational level had lower PR of heavy episodic drinking. All the ages showed a significant association regarding the age of 65,

Table 4. Adjusted* prevalence ratios of recent alcohol use for men and women, Brazilian Health Survey, 2013.

Variables	Men			Women		
	Recent alcohol use ^a			Recent alcohol use ^a		
	PR	95%CI	p-value	PR	95%CI	p-value
Skin color						
Non-white	Ref			Ref		
White	1.1	1.1 – 1.2	< 0.001	1.0	0.9 – 1.1	0.55
Age (years)						
65 or older	Ref			Ref		
55 to 64	1.6	1.4 – 1.8	< 0.001	1.9	1.4 – 2.5	< 0.001
45 to 54	1.7	1.5 – 2.0	< 0.001	2.4	1.8 – 3.1	< 0.001
35 to 44	1.8	1.6 – 2.1	< 0.001	2.4	1.9 – 3.2	< 0.001
25 to 34	1.9	1.6 – 2.1	< 0.001	2.8	2.1 – 3.6	< 0.001
18 to 24	1.5	1.3 – 1.8	< 0.001	2.8	2.1 – 3.6	< 0.001
Educational level (in years)						
Until incomplete elementary school	Ref			Ref		
Complete elementary and incomplete high schools	1.1	1.0 – 1.2	0.03	1.3	1.1 – 1.5	< 0.001
Complete high school and incomplete upper school	1.0	1.0 – 1.1	0.49	1.4	1.2 – 1.6	< 0.001
Complete upper school	1.2	1.1 – 1.3	< 0.001	2.0	1.8 – 2.3	< 0.001
Marital status						
Married	Ref			Ref		
Single	1.2	1.1 – 1.3	< 0.001	1.5	1.4 – 1.7	0.00
Separated/divorced	1.2	1.1 – 1.4	< 0.001	1.7	1.4 – 2.0	0.00
Widowed	1.0	0.8 – 1.2	0.74	1.1	0.8 – 1.4	0.55
Area of residence						
Rural	Ref			Ref		
Urban	1.2	1.1 – 1.3	< 0.001	1.8	1.5 – 2.1	0.00

^aConsumption of any amount of alcohol in 30 days before the research; *prevalence ratios adjusted by all the studied variables; PR: prevalence ratio; 95%CI: 95% confidence interval.

and the ages of 25 to 34 had the highest PR. Being single or separated and living in urban areas, in the contrary of being married and living in rural area, were also factors associated with the heavy episodic drinking (Table 5).

Table 5. Adjusted prevalence ratios* of heavy episodic drinking among subjects who reported alcohol consumption, Brazilian Health Survey, Brazil, 2013.

Variables	Men			Women		
	Heavy episodic drinking ^a			Heavy episodic drinking ^a		
	PR	95%CI	p-value	PR	95%CI	p-value
Skin color						
Non-white	Ref			Ref		
White	0.8	0.8 – 0.9	< 0.001	0.8	0.7 – 0.9	< 0.001
Age (years)						
65 or older	Ref			Ref		
55 to 64	1.4	1.1 – 1.8	0.01	2.0	1.2 – 3.3	0.01
45 to 54	2.0	1.6 – 2.6	< 0.001	2.6	1.7 – 4.1	< 0.001
35 to 44	2.2	1.7 – 2.7	< 0.001	3.2	2.0 – 4.9	< 0.001
25 to 34	2.3	1.8 – 2.9	< 0.001	3.6	2.3 – 5.7	< 0.001
18 to 24	2.2	1.7 – 2.7	< 0.001	3.1	2.0 – 4.8	< 0.001
Educational level						
Until incomplete elementary school	Ref			Ref		
Complete elementary and incomplete high schools	0.9	0.8 – 1.0	0.14	1.0	0.9 – 1.2	0.52
Complete high school and incomplete upper school	1.0	0.9 – 1.0	0.22	1.0	0.8 – 1.1	0.58
Complete upper school	0.9	0.8 – 1.0	0.09	0.8	0.6 – 0.9	< 0.001
Marital status						
Married	Ref			Ref		
Single	1.2	1.1 – 1.2	< 0.001	1.3	1.2 – 1.5	< 0.001
Separated/divorced	1.2	1.0 – 1.4	0.01	1.4	1.2 – 1.7	< 0.001
Widowed	1.2	1.0 – 1.4	0.20	1.1	0.8 – 1.6	0.69
Area of residence						
Rural	Ref			Ref		
Urban	1.1	1.0 – 1.2	0.15	1.3	1.0 – 1.6	0.02

*Prevalence ratios adjusted for the all other studied variables; ^aConsumption of 4 or more doses of alcohol for women and 5 or more doses of alcohol for men in a single occasion in 30 days before the research among those who consumed alcohol in this period; PR: prevalence ratios; 95%CI: 95% confidence interval.

DISCUSSION

This study analyzed the alcohol use patterns among men and women with a large sample of the Brazilian population. We observed that a little more than one third of the male population reported recent alcohol use, and about half of them also presented heavy episodic drinking; and the prevalence of men was more than twice that observed among women.

The analysis stratified by sex also enabled the identification of different relations between sociodemographic characteristics and alcohol use. With regard to recent use, only the association with skin color was different among sexes and, regarding heavy episodic drinking, educational level and area of residence showed different relations for men and women. We could also find a convergence of alcohol use among the youngest subjects, single and divorced and residents of urban areas for both consumption patterns.

Previous studies also found that men drink more than women^{17,18}, and differences in consumption refer to the amount and way they drink, besides social and health consequences to which they are subject to².

Due to biological factors, the intake of the same amount of alcohol produces higher alcoholic concentration in the blood of women¹⁹, which could explain the trend of men drinking in higher amounts and more frequently than women. However, the great magnitude of man/woman ratio observed in different contexts suggests that cultural influence, socioeconomic context, work and the fact that alcohol is a symbol of masculinity expose the male sex more to its use^{20,21}. Therefore, higher frequency of harmful consequences associated with alcohol use is observed among men^{1,2,7}.

We observed in this paper that the prevalence of recent alcohol use and heavy episodic drinking was higher in younger populations, especially among women. Differences between the prevalence of alcohol use and heavy episodic drinking, if we compare men and women, increased with age and therefore they showed higher consumption proximity in the ages of 18 to 24; therefore, they corroborate with reduction in gender differences in alcohol use theory among younger cohorts²¹. A study performed in the United States also described a decrease in the differences among genders regarding alcohol use, especially in younger cohorts²². The National Adolescent School-based Health Survey (PeNSE), a survey including 13 to 15-year-old students, pointed that alcohol in this age has been more consumed by girls²³.

The ages of 18 to 34 presented the highest risk for alcohol use and heavy episodic drinking among men and women, which is in agreement with other studies^{9,12-15} and can be explained by the higher tolerance and support of the society to use alcohol among young people, in addition to the investment by the industry in marketing strategies directed to this audience²⁴.

High educational level was positively associated with alcohol use among men and women, which can be explained by the higher purchasing power in this population, by the facilitated

access and by lower social restrictions^{12,25}. However, the educational level was not associated with heavy episodic drinking and it is also a factor that is negatively related to the pattern of higher risk among women.

Epidemiological studies also presented divergences in the association between educational level and socioeconomic level with alcohol use. Some papers found high educational level and/or income associated with risk consumption^{12,15,26}, while others have found a higher rate of drinkers among subjects with lower educational level^{13,27,28} or did not even find a relation^{9,14}. Nevertheless, there is strong evidence that people with lower socioeconomic level are more susceptible to suffering consequences regarding the use of alcohol²⁹. Therefore, with the aim of decreasing health inequalities, strategies to control and prevent the heavy use of alcohol in this group are extremely important, because these subjects present a higher concentration of other health risk factors.

In the present study, white-skinned color showed divergences regarding sexes and recent alcohol use: among men, it was associated with recent alcohol use and among women, it was not. However, subjects with this skin color had higher probabilities of heavy episodic drinking, which coincides with lower mortality due to alcohol-related disorders in this group⁶. This fact might be explained by the synergism of inequalities observed in Brazil, where the black population presents the lowest educational levels and socioeconomic condition³⁰, which highlights the need of interventions focused on this group, especially among women, whose difference between ethnicities is more remarkable.

Regarding marital status, single and separated/divorced subjects presented a higher proportion of recent alcohol use and heavy episodic drinking, and the association was higher among women. Studies have also found that a stable relationship was a protective factor for habitual use of alcohol among women^{8,9,14,26,31}.

Living in urban areas was associated with alcohol use among men and women. No other similar study was found in the country with a representative sampling of urban and rural populations. Nevertheless, results follow a previous study that compared two cities with different levels of urbanization¹³. The hypothesis for such observation is that urbanization increases: access to alcoholic beverages (sale places, kinds of beverages, kinds of events, scheduling, etc.); marketing exposure to sales promotion and other consumption stimuli; and access to paid work, which enables purchasing¹³.

Regarding the differences found between sexes, men and women that live in rural areas of the country, in general, present traditional sex roles, in which the woman remains at home and is in charge of house chores and of taking care of the children and men have paid jobs outside the residency¹³. This condition differs from what is seen in urban areas, where women have other roles: work, have different social and leisure activities and is more exposed to alcohol use. Thus, results obtained in the rural area tend to be closer to those observed in countries with lower development level – increased use of alcohol among men, especially heavy episodic drinking —; and there is a convergence in the urban area regarding

the proportion of drinkers among genders, which is a similar result to countries with higher development level³².

Brazil is one of the signers of the Global Strategy to Decrease Harmful Use of Alcohol³³, which was approved by the World Health Assembly. The document provides recommendations on how to structure health services of counseling and treatment; how to involve the community in the identification of needs and solutions; control policies of the alcohol limit for drivers; restrictions on alcohol physical availability; merchandising control; and increase of taxes and prices³³.

Some of these aspects are present in the Brazilian Plan on Alcohol³⁴, in the Noncommunicable Chronic Disease Action Plan³⁵, and in the prohibition to drink and drive^{36,37}. However, after analysis of the public policies adopted in the country regarding decrease of alcohol harmful use, we observed that the main measures that could avoid convergence in the consumption patterns and decrease heavy use of alcohol by men and women, such as restriction of marketing, sponsors and promotions and increase of prices and limits of sales⁷, are not being adopted in the country. In addition, current laws are not very well regulated, thus resulting in temporary gains in public health, similarly to what has been seen with *Lei Seca*³⁸.

The study has some limitations. Since the indicators were self-reported, there is a possibility of underrating and due to the cross-sectional design, associations might not indicate causality. We use the PR as a measurement of association in the proposed models. Other measurements could have been used, such as the Relative Risk; however, we chose it because of the cross-sectional design.

CONCLUSION

This paper provides developments in the study on alcohol use by the Brazilian population. It also found that alcohol use (including heavy episodic drinking) is more increased in men than in women, and the sex analysis allowed to identify different relations between this use and the analyzed characteristics. Regarding recent alcohol use, only skin color had a different association between genders: it was positive among white men, but it was not in women. Heavy episodic drinking was associated with living in urban areas and inversely associated with educational level only among women. The study also showed convergence of alcohol consumption, including heavy episodic drinking, among younger men and women, single and divorced and those living in urban areas.

This study highlights the immediate need of implementing effective public policies to avoid initiating the alcohol use and to prevent episodes of heavy use. These actions should be directed to young subjects, black people, women who live in urban areas and population with low socioeconomic level in the country.

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