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Short communication

What is associated with the increased frequency of heavy episodic drinking during the COVID-19 pandemic? Data from the PAHO regional web-based survey

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ABSTRACT

Background: To estimate the prevalence of changes in the frequency of self-reported heavy episodic drinking (HED) among drinkers in Latin America and Caribbean countries on alcohol consumption during the COVID-19 pandemic, and to assess self-reported factors associated with the increased frequency of HED.

Methods: Data from 12,328 adults who responded to the cross-sectional survey conducted in 33 countries of Latin America and the Caribbean by Pan American Health Organization were used. Logistic regression analyses were performed to estimate the effect of the sociodemographic characteristics, quarantine practices, and anxiety symptoms on the increase in frequency of HED among the 2019 drinkers.

Results: 65 % of drinkers in 2019 self-reported HED during the COVID-19 pandemic with 13.8 % of the drinkers reporting an increase in HED compared to a 33.38 % decrease in HED. Multivariable analysis indicated that male gender (aOR 1.29, 95 %CI 1.13; 1.49), higher income (aOR 1.64, 95 %CI 1.35; 1.99) and higher level of quarantine practices (aOR 1.10, 95 %CI 1.04; 1.16) were positively associated with increased frequency of HED; unemployment (aOR 0.78, 95 %CI 0.64; 0.96), student status (aOR 0.53, 95 %CI 0.43; 0.64) and living with children (aOR 0.91, 95 %CI 0.84; 0.99) were negatively associated with increased frequency of HED. A gradient of association was found between generalized anxiety disorder and an increase in HED frequency during the pandemic.

Conclusion: Along with other measures to decrease the spread of COVID-19, it is important to include measures to reduce alcohol consumption and address mental health conditions in the national response to the pandemic.

1. Introduction

The novel coronavirus, SARS-CoV-2 has brought significant and unprecedented changes to the entire world since first being reported in China in December 2019 (PAHO/WHO, 2020). The scale of the pandemic sparked public health concerns of how facing hardships related to socioeconomic effects, fear of contracting the virus and stressful adaptive challenges in everyday activities would have an impact on the physical and mental health of individuals and entire societies (UNITED NATIONS, 2020).

One of the common methods of coping with anxiety, stress, uncertainty and unpleasant emotions is alcohol use (Brooks et al., 2020; Keyes

et al., 2011). There is well-documented evidence suggesting alcohol use can increase during difficult time periods like disasters and pandemics (Brooks et al., 2018; North et al., 2011; World Health Organization, 2020; Wu et al., 2008).

With alcohol consumption levels in the Region of the Americas being higher than the global average, there is significant concern regarding the possibility of changes in alcohol consumption and the potential impacts on individuals as alcohol poses many acute and chronic risks to health (Banks et al., 2019; WHO, 2018). Alcohol consumption weakens the immune system, thus making individuals more susceptible to contracting infectious diseases, including COVID-19 (Testino, 2020). Heavy use of alcohol increases the risk of acute respiratory distress syndrome

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(ARDS), which is one of the most severe complications of COVID-19 (Simou et al., 2018). Alcohol use increases the risk, frequency and severity of perpetration of interpersonal violence including domestic and sexual violence (Curtis et al., 2019).

Recent online surveys conducted in Argentina, Brazil, Colombia, and Mexico indicate anxiety as one of the most commonly reported mental distress symptoms during the pandemic (Badellino et al., 2020; Goularte et al., 2021; Martínez et al., 2020). However, the impact of the pandemic on alcohol consumption and its association with the mental health status of individuals remains unknown in the Latin American and Caribbean countries (Garcia and Sanchez, 2020; Monteiro et al., 2020; Rehm et al., 2020).

In order to understand the current situation in greater depth, the Pan American Health Organization (PAHO) conducted a regional study focused on alcohol consumption and associated risks during the pandemic in all Latin American and Caribbean countries. The aim of the present study is to estimate the prevalence of changes in the frequency of self-reported heavy episodic drinking (HED) among drinkers in Latin America and Caribbean countries who participated in the PAHO regional survey on self-reported alcohol consumption during the COVID-19 pandemic, and to analyze the self-reported factors associated with the increase in the frequency of self-reported HED, with emphasis on sociodemographic characteristics, quarantine practices, and anxiety symptoms among drinkers.

2. Methods

2.1. Study design and participants

This is a cross-sectional study based on the online survey known as “Alcohol Use during the COVID-19 pandemic in Latin America and the Caribbean” conducted by PAHO. The self-reported questionnaire was widely and repeatedly disseminated through PAHO’s communication platforms including, Facebook, Twitter, the Pan American Network for Alcohol and Public Health (PANNAPH), and other networks such as the Healthy Caribbean Coalition, the Healthy Coalition of Latin America, as well as through PAHO staff and individual contacts. From the 23,058 respondents who accessed the weblink, 12,328 (53.50 %) agreed to participate and answered the online questionnaire, from 22 May to 30 June 2020. To be eligible, participants needed to be aged at least 18 years old, living in one of the 35 Latin American or Caribbean countries or territories, and did not travel out of their country since 15 March 2020. The participants provided electronic consent prior to completing the questionnaire and they were informed that they could withdraw from the survey at any moment without providing any justification. This study was approved by the Ethics Review Committee of PAHO (PAHOERC 0214.01).

2.2. Instrument and variables

To collect the data, we used an online anonymous self-report questionnaire, through Qualtrics software, with 55 questions translated into four languages (English, Spanish, Portuguese, and French) and covering the following: sociodemographic characteristics; COVID-19 related questions, including precautionary measures taken in daily life; anxiety symptoms in the past 14 days; alcohol consumption habits in 2019; and alcohol consumption habits during the COVID-19 pandemic period.

The dependent variable was self-reported change in Heavy Episodic Drinking (HED) during COVID-19 pandemic period in 2020. The data relating to HED were collected through a single question that measured the frequency of the behavior with seven possible responses (ranging from never to everyday). The question was formulated as follows: “How often did you drink five or more standard drinks in one occasion. (One STANDARD drink is equivalent to a can of beer (355 mL), a glass of wine (150 mL), or a shot of distilled spirits (40 mL)”. The same question was asked related to the frequency of HED in 2019 and in the COVID-19

pandemic period in 2020. We constructed the change HED variable from the difference between HED frequency responses in 2019 and 2020. Change in HED was classified as: never reported HED, did not change the HED pattern from 2019, increased frequency of HED and decreased frequency of HED. If the subtraction of frequency in 2020 (during the pandemic) and 2019 was zero, we considered that there was no change in HED, separating those whose subtraction was zero due to reporting no HED in 2019 and in 2020. If it was a positive number, we considered an increase in frequency, and if it was a negative number, it was categorized as a decrease.

The independent variables were self-reported sociodemographic characteristics, quarantine and anxiety symptoms.

Sociodemographic characteristics were considered sex, age, household income (from less than one to more than 20 monthly wages), living area status (urban or rural), working situation (not working, working, student and retired) and living status (living with children until 12 years old and living alone).

The data related to quarantine were collected through one single question measuring the engagement of participants in social distance practices as a consequence of COVID-19 pandemic: 1. avoiding public transport and social gatherings; 2. working/studying from home; 3. home-schooling children/keeping pre-school children home from day care; 4. asked to stay in isolation at home after travel overseas; 5. staying in isolation at home due to own or household members vulnerability to COVID-19; 6. home quarantine (tested positive for COVID-19 and stayed at home); 7. admitted to hospital (tested positive for COVID-19 and 8. admitted to hospital and quarantined to a hotel room). The more options marked the more situations of social distance the subject was involved and stricter was the quarantine (ranging from 0 to 8).

Anxiety symptoms were assessed through a 7-item Generalized Anxiety Disorder Scale (GAD-7) (Ruiz et al., 2011). Participants were asked to rate the severity of seven anxiety symptoms experienced over the past two weeks. The GAD-7 score is calculated by assigning scores of 0, 1, 2, and 3, to the response categories of “not at all,” “several days,” “more than half the days,” and “nearly every day,” respectively, and then adding together the scores for the seven questions. GAD-7 total score for the seven items ranges from 0 to 21. Scores of 5, 10, and 15 represent cut-points for mild, moderate, and severe anxiety, respectively.

2.3. Statistical analysis

Comparisons between the change self-reported HED profiles among drinkers (that is, respondents who have reported drinking in 2019) were performed using chi-square test or ANOVA according to the type of variable. Logistic regression analysis was performed (univariate and multivariate), in which we estimated the effect of the independent variables in the increase of the frequency of HED among the 2019 drinkers. The regressions were performed using STATA cluster option that indicated the non-independence of the participants due to the cluster structure of the data (i.e., participants nested in 33 countries and 2 territories) and subsequently, the standard error was computed, considering the multi-level structure. Inferential estimates are given as adjusted odds ratios (aORs) with their respective 95 %CIs and p-values. Odds ratios were adjusted for all covariates in the model. Stata SE version 16 was used to conduct all analyses with a level of significance set at 5%.

3. Results

The current analytic sample includes 9554 adults who self-reported drinking in 2019. The majority of the participants were women (64 %), with an average of 37.8 years of age, who were working (75.5 %), living in urban areas (91.6 %), with a household income of more than 11 minimum wages per month (31.27 %) and self-reporting mild anxiety symptoms (37.7 %). About 65 % of drinkers in 2019 self-reported

Table 1

Sociodemographic characteristics considering the change in frequency of self-reported HED^b among drinkers participants of the “Alcohol Use during the COVID-19 pandemic in Latin America and the Caribbean” survey, 2020 (N = 9.554).^a

	Total		No HED ^b		HED equal ^b		Decrease HED ^c		Increase HED ^d		p-value
	n = 9.554		n = 2.942 (34.94 %)		n = 1.505 (17.87 %)		n = 2.811 (33.38 %)		n = 1.162 (13.80 %)		
	n	%	n	%	n	%	n	%	n	%	
Sex											<0.001
Women	5.292	64.00	2.189	41.36	762	14.40	1.660	31.37	681	12.87	
Men	2.977	36.00	695	23.35	716	24.05	1.105	37.11	461	15.49	
Age group											<0.001
18 to 29 yo	2.857	29.90	537	22.04	469	19.25	1.154	47.37	276	11.34	
30 to 39 yo	2.919	30.55	823	31.79	520	20.08	841	32.48	405	15.65	
40 to 49 yo	1.934	20.24	732	41.95	284	16.28	440	25.21	289	16.56	
50 to 59 yo	1.200	12.56	516	47.82	172	15.94	258	23.91	133	12.33	
60+ yo	644	6.74	334	58.49	60	10.51	118	20.67	59	10.33	
Mean Age (SD)	37.79 ± 12.58		42.06 ± 12.95		36.38 ± 11.37		34.57 ± 11.90		38.33 ± 11.34		
Family Income											<0.001
<1 min.wage	1.113	13.45	321	28.84	176	15.81	496	44.56	120	10.79	
1–4 wages	2.546	30.77	788	30.95	514	20.19	949	37.27	295	11.59	
5–10 wages	2.028	24.51	762	37.57	352	17.36	615	30.33	299	14.74	
>11 wages	2.028	31.27	1.000	38.65	448	17.32	703	27.17	436	16.86	
Work Situation											<0.001
Not working	1.177	12.32	305	30.53	184	18.42	396	39.64	114	11.41	
Working	7.215	75.52	2.301	36.02	1.174	18.38	1.970	30.84	943	14.76	
Student	850	8.90	185	24.41	120	15.83	384	50.66	69	9.10	
Retired	312	3.27	151	54.91	27	9.82	61	22.18	36	13.09	
Living status											
With children	4.721	49.41	1.521	36.88	716	17.36	1.343	32.57	544	13.19	0.003
Alone	923	9.66	303	36.24	143	17.11	258	30.86	132	15.79	0.158
Living area											0.002
Urban	7.566	91.56	2.664	35.21	1.352	17.87	2.489	32.90	1.061	14.02	
Rural	697	8.44	203	29.12	136	19.51	269	38.59	89	12.78	
Mean Quarantine (SD)	2.10 ± 0.99		2.18 ± 0.95		2.04 ± 0.98		2.12 ± 0.97		2.24 ± 1.03		0.012
GAD ^e											<0.001
Normal	3.314	34.69	1.210	40.84	491	16.57	906	30.58	356	12.01	
Mild	3.598	37.66	1.108	35.05	583	18.44	1.052	33.28	418	13.23	
Moderate	1.491	15.61	366	28.18	252	19.40	484	37.25	197	15.17	
Severe	1.151	12.05	258	25.88	179	17.95	369	37.01	191	19.16	

^a All descriptive models were estimated between those who reported drinking in 2019.

^b HED: Heavy Episodic Drinking.

^c GAD: Generalized Anxiety Disorder Scale.

HED during the COVID-19 pandemic with 13.8 % of the drinkers reporting an increase and 33.38 % reporting a decrease in self-reported HED frequency (Table 1).

In the multivariate analysis, the increase in frequency of self-reported HED during the COVID pandemic was positively associated with being a man (aOR 1.29, 95 %CI 1.13; 1.49), with higher income (eg. more than 11 wages aOR 1.64, 95 %CI 1.35; 1.99) and with higher level of self-reported quarantine practices (aOR 1.10, 95 %CI 1.04; 1.16). On the other hand, increase in self-reported HED was inversely associated with, not working (aOR 0.78, 95 %CI 0.64; 0.96), being a student (aOR 0.53, 95 %CI 0.43; 0.64) and living with children (aOR 0.91, 95 %CI 0.84; 0.99). We found a gradient of association between self-reported generalized anxiety disorder symptoms and the increase in frequency of self-reported HED during the pandemic, the more severe the anxiety symptoms the greater the chance of increasing the frequency of self-reported HED (eg. mild aOR 1.18, 95 %CI 1.04; 1.33; moderate aOR 1.43, 95 %CI 1.22; 1.69 and severe aOR 1.99 95 %CI 1.74; 2.27) (Table 2).

4. Discussion

This study provides insight into the pattern of self-reported HED and the self-reported factors associated with an increase in the frequency of self-reported HED during the COVID-19 pandemic among the largest sample of inhabitants Latin American and Caribbean reported to date. The present study suggested that the increase in the frequency of self-reported HED during the first months of the COVID-19 pandemic was associated with being a male, with all levels of self-reported anxiety

symptoms, amount of self-reported quarantine strategies practiced, higher income, unemployment, being a student and not living with a child. Among 2019 drinkers, 65 % reported self-reported HED and 33.38 % reported a decrease and 14 % reported an increased frequency of self-reported HED during the first 4 months of the COVID-19 pandemic.

Considering the risks associated with home-drinking (Callinan and MacLean, 2020), including the consumption of higher amounts of alcohol (Foster and Ferguson, 2012) and domestic violence (WHO 2006), this study is focused on the factors associated with the increase in HED self-reporting during the COVID-19 pandemic. However, it is important to highlight that among those who self-reported HED, the majority of the sample reported a decrease in the frequency of HED during the COVID-19 pandemic. These findings are in line with other self-report studies, such as an Australian study that also found that harmful drinking decreased during the pandemic (Callinan et al., 2020) and with an online survey carried out in Asia, Africa and Europe that showed a significantly decrease in binge drinking (Ammar et al., 2020). Studies using more objective measures also found the same trends such as an UK study that reported that households did not buy more alcohol during the pandemic (Anderson et al., 2020) and an Australian study that provided evidence from wastewater analysis suggesting a decrease in population-level weekend alcohol consumption (Bade et al., 2020). However, other self-reported COVID-studies described opposite findings, such as an study conducted in the UK that showed an increase in binge drinking (Niedzwiedz et al., 2020), a Czech study that also found an increase in weekly binge drinking (Winkler et al., 2020) and a study carried out with the US and UK populations that also showed that heavy episodic drinking increased significantly (Daly and Robinson, 2020).

Table 2

Univariate and Multivariate Analysis^{a,b} of factors associated with the increase in self-reported Heavy Episodic Drinking (HED) among drinkers participants of the “Alcohol Use during the COVID-19 pandemic in Latin America and the Caribbean” survey. 2020 (N = 8.167).

	Univariate Analysis			Multivariate Analysis		
	OR	95 % CI	p-value	aOR	95 % CI	p-value
Male	1.24	1.10; 1.40	<0.001	1.29	1.13; 1.49	<0.001
Age	1.00	0.99; 1.01	0.535	0.99	0.99; 100.18	0.156
Area Living						
Urban	Ref			Ref		
Rural	0.96	0.90; 1.03	0.263	1.00	0.93; 108.158	0.917
Income						
<1 wage	Ref			Ref		
1–4 wages	1.08	0.86; 1.36	0.488	1.03	0.84; 1.27	0.765
5–10 wages	1.43	1.14; 1.79	0.002	1.38	1.11; 172.46	0.004
>11 wages	1.68	1.38; 2.04	<0.001	1.64	1.35; 1.99	<0.001
Work situation						
Working	Ref			Ref		
Not working	1.34	1.11; 1.63	0.003	0.78	0.64; 0.96	0.018
Student	0.78	0.60; 1.00	0.051	0.53	0.43; 0.64	<0.001
Retired	1.17	0.81; 1.68	0.396	0.91	0.75; 1.12	0.388
Living status						
With children	0.90	0.83; 0.98	0.022	0.91	0.84; 0.99	0.040
Alone	1.02	0.98; 1.04	0.093	1.01	1.00; 1.03	0.092
Quarantine (Score)	1.12	1.06; 1.19	<0.001	1.10	1.04; 1.16	0.001
GAD ^c						
Minor	Ref			Ref		
Mild	1.11	0.99; 1.26	0.077	1.18	1.04; 1.33	0.010
Moderate	1.31	1.10; 1.55	0.002	1.43	1.22; 1.69	<0.001
Severe	1.73	1.53; 1.97	<0.001	1.99	1.74; 2.27	<0.001

^a Odds ratios [95 % CI] were derived from logistic regression models predicting increase in self-reported heavy episodic drinking taking as reference the other categories combined (equal/decrease/never heavy episodic drinking).

^b All models were estimated with cluster in country and were performed between those who self-reported drinking in 2019.

^c GAD: Generalized Anxiety Disorder Scale.

These mixed findings may be due to the different measures adopted by national authorities to deal with the spread of COVID pandemic (e.g. lockdown was adopted in many European countries but not in Brazil) as well as different cultural norms related to alcohol consumption.

Higher self-reported quarantine practices and higher levels of self-reported anxiety symptoms were associated with greater risk of increasing self-reported HED during the first months of the pandemic, suggesting that the restrictions on social interaction may have impacted on people emotions. These findings are consistent with previous studies conducted in the United States of America (Rodriguez et al., 2020), Australia (Callinan et al., 2020; Stanton et al., 2020; Tran et al., 2020), and India (Verma and Mishra, 2020) indicating that, potentially, alcohol

is used to cope with distress related to the pandemic (de Goeij et al., 2015; Koob and Kreek, 2007), consistent with the self-medication theory (Khantzian, 1997). It is important to highlight that because this is a cross-sectional study, it is not possible to assign the direction of the association. Thus, it is possible that higher self-reported HED could also have led to higher anxiety symptoms.

Although prior research showed that during the pandemic having children at home increases mental distress (Kisely et al., 2020), our results suggest that the presence of children in the home during the pandemic is a protective factor for the increase in self-reported HED, independent of the self-reported anxiety symptoms. Our findings are in line with pre-pandemic evidence indicating that parents are less likely than non-parents to exceed alcohol consumption (Bowden et al., 2019).

This study has some limitations. First, this is a cross-sectional survey and no assumption on causality can be made. Second, the study measures are self-reported and individuals who drink at higher levels may have not participated in the study as well as heavier drinkers may be more likely to complete the survey. Third, considering this is a cross-sectional study asking participants about past exposures, we must consider the possibility of recall bias in the self-reporting measures as well as lack of longitudinal follow-up. Despite the fact that it is very common to use self-report measures to assess alcohol consumption it is important to highlight that they are potentially subject to recall bias and error, in addition to significant underestimated consumption (Greenfield and Kerr, 2008). In addition, we must consider that the title of the survey “Alcohol Use during the COVID-19 pandemic in Latin America and the Caribbean” may have potentially introduced a bias in the study, reducing the probability of the participation of abstainers. Finally, it is a non-probabilistic online sample and it does not represent the general population, which limits the generalizability of the results.

On the other hand, our findings are important for public policies as they show that during the COVID-19 pandemic, people who self-reported anxiety symptoms are more vulnerable to increase self-reported HED, indicating that the need to address mental health issues should be supplemented by restrictions on the availability of alcohol. These findings highlight that preventive public mental health actions should be planned and put into practice in order to reduce the impact on health and wellbeing of the population of Latin America and Caribbean countries. It is important to continue to assess alcohol consumption during the ongoing pandemic and in the post recovery time period, within households and in public settings to ensure a comprehensive response to alcohol problems in these societies.

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Contributors

The submitted manuscript has been read and approved by all authors. All authors acknowledge that they have exercised due care in ensuring the integrity of the work. JYV was responsible for the statistical analysis, and also wrote the results, methods and the discussion. IS wrote the introduction. RGC helped with the analysis. MM designed the original study and review the final version of the manuscript. ZS helped in the design of the original study, helped interpreting the results and was responsible for the final approval of the version to be published. None of the original material contained in the manuscript has been submitted for consideration nor will any of it be published elsewhere. Dr Monteiro is a staff of the Pan American Health Organization. The views and positions expressed in the article are only hers and may not necessarily reflect the views or policies of the Organization.

Declaration of Competing Interest

Dr. Monteiro is a staff of the Pan American Health Organization

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