

Gender Differences in Predrinking Behavior Among Nightclubs' Patrons

Mariana G. R. Santos, Angela T. Paes, Adriana Sanudo, Solange Andreoni, and Zila M. Sanchez

Background: Drinking before entering nightclubs (predrinking) seems to be associated with an increase in alcohol-related harm. This study aims to investigate gender differences in predrinking behavior and to evaluate its association with risk behaviors practiced inside nightclubs.

Methods: Individual-level data were collected by a portal survey of 2,422 patrons at the entrance and 1,833 patrons at the exit of 31 nightclubs located at São Paulo, Brazil. The nightclubs were selected by 2-stage sampling with probability proportional to the establishments' capacity in the first stage and a systematic sample of patrons in the entrance line in the second stage. Breath alcohol concentration (BrAC) was measured at the entrance and exit. Face-to-face interviews identified predrinking characteristics and risk behaviors. Weighted analyses were stratified by gender.

Results: Predrinking was practiced by 49.2% (95% confidence interval [CI] = 42.7 to 55.8) of the male patrons and 29.0% (95% CI = 20.6 to 38.9) of the female patrons ($p < 0.001$) on the day of the interview. When considering only predrinkers, men and women showed similar BrAC at entrance and exit and similar proportion of alcoholic intoxication (BrAC ≥ 0.38 mg/l). In both genders, people who practiced predrinking on the day of the interview were more likely to drink inside the nightclub, compared to those who did not practice predrinking ($p < 0.001$). Among men, the practice of predrinking increased the chance of "drinking and driving" after leaving the nightclub (odds ratio [OR] = 6.9, 95% CI = 4.1–11.5, $p < 0.001$). Among women, the practice of predrinking increased the chances of experiencing sexual harassment in the nightclub (OR = 2.9, 95% CI = 1.3 to 6.6, $p = 0.010$).

Conclusions: Predrinking is more prevalent among men; however, men and women who engaged in predrinking have a similar pattern of alcohol consumption and exit BrAC. The fact that risk behaviors and illicit drug use were associated with predrinking but differ between genders suggests that a gender-specific approach should be used in tailored interventions to prevent alcohol-related harm in nightclubs.

Key Words: Alcohol, Predrinking, Epidemiology, Risk Behaviors, Brazil.

PREDRINKING (OR PRELOADING) is defined as the use of alcohol before entering licensed premises such as nightclub, bar, or party (Borsari et al., 2007). It has been particularly investigated by researchers in the United States and the United Kingdom. The findings show that the consumption of alcohol prior to attending licensed premises seems to occur whether patrons aim to save money and/or to facilitate peer and sexual interaction (Foster and Ferguson, 2014). Studies show that young people drink heavily before going out to bars and nightclubs and that this habit is associ-

ated with an increase in alcohol-related harm such as alcoholic blackouts, vomiting (Labrie et al., 2011), alcohol poisoning (Labrie and Pedersen, 2008), impaired motor coordination and cognitive skills (Kenney et al., 2010), and alcohol-related violence (Borsari et al., 2007).

In a study conducted on recreational areas among young people between 18 and 35 years in England, 55% of men and 60% of women reported that predrinking is a priority for them before attending bars and/or nightclubs, and it was identified that among predrinkers, there is a greater risk of ending the night with high alcoholic levels (up to more than 20 alcoholic drinks on occasion) and engage in aggression and crimes inside the nightclubs (Hughes et al., 2008).

A study conducted in 4 European countries found that over half of the participants of both genders from the United Kingdom, Netherlands, and Spain, and a third from Slovenia, had consumed alcohol before going to bars and nightclubs on the survey night. Gender differences in this preloading behavior was only significant in the United Kingdom, where women reported more preloading (70.3%) than men (51.0%) (Hughes et al., 2011).

Hughes and colleagues (2008) believe that the main problem of predrinking is related to the way people drink

From the Department of Preventive Medicine (MGRS, ZMS), Section of Epidemiology, Universidade Federal de São Paulo, São Paulo, Brazil; Department of Information in Health (ATP), Section of Statistics, Universidade Federal de São Paulo, São Paulo, Brazil; and Department of Preventive Medicine (AS, SA), Section of Biostatistics, Universidade Federal de São Paulo, São Paulo, Brazil.

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Reprint requests: Zila M. Sanchez, PhD, Department of Preventive Medicine, Universidade Federal de São Paulo, Rua Botucatu, 740, 4º andar, São Paulo, SP, Brazil. Tel.: + 55 11989348282; E-mail: zila.sanchez@unifesp.br

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(i.e., generally, this behavior involves rapid consumption of large amounts of alcohol, and in these cases, blood alcohol levels change within minutes, leading to increased risk of the individual suffering from the effects of alcohol intoxication cited above). In the places where predrinking is commonly practiced, an individual is likely to use other types of drugs such as marijuana and cocaine because there is no social control and because their perception of risk is decreased due to the effect of alcohol (Zamboanga et al., 2010).

Predrinking can result in more consumption of beverages during the night (Labrie and Pedersen, 2008) and may contribute to a higher alcohol blood concentration (Read et al., 2010). Particularly in female students, drinking large amounts of alcohol in a short period of time increase its concentration of alcohol in the blood, thereby putting themselves at similar risk to males (Mallett et al., 2009).

Across the world, gender differences in alcohol consumption represent a universal phenomenon (Wilsnack et al., 2005). Several studies show that women are more vulnerable than men to many medical consequences of alcohol abuse. For example, comparing alcoholic women to alcoholic men, after fewer years of heavy drinking, alcoholic women are more likely to develop cirrhosis (Loft et al., 1987), alcohol-induced damage of the heart muscle (Fernández-Solà et al., 1997), and nerve damage (Ammendola et al., 2000) compared to alcoholic men. Regarding alcohol intoxication and development of alcoholism, men are consistently more than twice as likely as women to report those problems (Gruza et al., 2008a,b). Despite all this knowledge, several important questions remain unanswered about gender differences on alcohol consumption.

Studies on biological gender differences have shown that alcohol has different effects on the female and the male body due to the greater average content of lipids and the smaller average content of water in women's bodies. The same amount of alcohol ingested leads to higher blood alcohol levels in women than in men (Bennett and Williams, 2003; Fals-Stewart et al., 2003; Flake and Forste, 2006).

According to WHO (2014), understanding how alcohol drinking patterns differ among genders is important to answer questions of how, why, and to what extent societies attempt to control or reduce alcohol-related problems, even though gender differences on drinking are associated with many aspects of biological differences and cultural gender-specific roles. Therefore, it is important to understand gender differences in predrinking behavior and to evaluate its association with risk behaviors practiced inside nightclubs, to guide future tailored interventions or public policies.

MATERIALS AND METHODS

The study was approved by the ethics committee of the Federal University of São Paulo (protocol number 72689 CAAE: 03285212.9.0000.5505).

Sampling

A portal survey was conducted at nightclubs in the city of São Paulo, and data were collected from nightclub patrons. This survey method (Voas et al., 2006) is a variation of the intercept survey (Miller et al., 1997) and was designed to intercept and measure behaviors at the right moment when they occur, in this case, use of alcohol and other drugs in potentially risk individuals, at the entrance and exit of nightclubs. This study was a 2-stage cluster sampling portal survey. The first stage consisted of a systematic sample of nightclubs with selection probability proportional to the nightclub maximum capacity. The second stage was a systematic sampling of every third person in the entrance line of the nightclubs. Data were collected during the first semester of 2013.

The nightclub frame list was created by an active search of magazines and guides specialized in leisure activities and the first 10 pages resulting from a Google search using the following key words: "São Paulo, Nightclubs, and Discos" (in Portuguese). The final frame list consisted of 150 nightclubs that met the inclusion criteria; 40 nightclubs and their replacements were drawn from this frame list (Voas et al., 2006). Replacements for the selected nightclubs were chosen from the ordered list in the event that any of the nightclubs that were originally selected refused to participate in the study. The replacements had the same capacity, were located in the same neighborhood, and were subject to the same probability of selection as the original nightclub sampled.

Some difficulties arose with this sampling method. First, the sample obtained could not reflect the original systematic sample that was proportional to the nightclubs' capacity. Second, replacements for moderate to large nightclubs were more difficult to obtain due to the lack of availability in a universe of 150 nightclubs in this kind of sampling. Fortunately, the sample of nightclubs still contained some moderate to larger clubs; the largest nightclubs agreed to participate, and smaller to moderate sized ones were easily replaced. Thus, the probability of a nightclub being selected had to be adjusted to reflect the original sampling scheme based on 40 nightclubs. Of the 40 original nightclubs selected for sampling, 31, including replacements, agreed to participate, resulting in an acceptance rate of 66%. An adjustment factor for nonresponse was used by weighting the 31 nightclubs in order to make them equivalent to the 40 selected nightclubs. The adjustments were estimated by a logistic regression model with agreement to participate in the study as the dependent variable and establishment size as the explanatory variable. The nightclub (clusters) weights were equal to the inverse selection probability multiplied by the nonresponse adjustment factor. More details on sample weights and study design are presented in Carlini and colleagues (2014) and Santos and colleagues (2015).

A target sample size of 1,600 patrons was calculated considering an absolute precision of 5% and a confidence interval (CI) of 95%, 2-stage cluster sampling and a design effect of 2 (Lwanga and Lemeshow, 1991). Considering a possible refusal rate of 30% and a maximum loss to follow-up from the entrance to the exit of 40% (Clapp et al., 2007), 2,912 patrons were initially approached.

A total of 3,063 approaches were conducted at the 31 nightclubs that participated in the study; 2,422 interviews (79.1% rate of acceptance by the respondents at the time of entry to the nightclubs) were performed. Among those young people who agreed to participate in the entrance, 1,833 were also interviewed at the time of exit of the nightclub (76% conducted follow-up). The reasons for missing the exit interview were refusal to participate ($n = 12$, 2.1%), inability to respond because of severe intoxication ($n = 67$, 11.3%), and loss to follow-up ($n = 510$, 86.6%).

Data Collection and Instruments

Patrons were systematically selected from the entrance lines of the nightclubs. The patrons that agreed to participate answered an

entrance and exit survey interview and completed a breathalyzer test after each interview (calibrated Dräger Alcotest 7410 plus; Lübeck, Germany). The patrons received a bracelet with a unique code to identify them at the nightclub exit. Seven field researchers used Samsung Galaxy Tablets (Manaus, Brazil) to collect the interview data, and data were sent to a central database in real time.

The first questionnaire conducted at the entrance of the nightclubs investigated sociodemographic variables, predrinking (a positive result on the breathalyzer test with breath alcohol concentration (BrAC) ≥ 0.01 mg/l), drinking patterns, drug use, and risk behaviors in nightclubs in the year prior to the survey. The final questionnaire conducted at the exit of the nightclubs included questions regarding alcohol consumption, drug use, and risk behaviors that patrons engaged in on that specific night inside the venue.

Variables

Predrinking was defined by the response to “drinking before entering the nightclub” (0 = no, 1 = yes). Patrons that reported no predrinking but showed a positive BrAC (3% of the sample) were excluded from the analysis. Binge drinking (or alcohol intoxication) was defined as BrAC ≥ 0.38 mg/l, which corresponds to a blood alcohol concentration of 0.08% (mean concentration for a binge drinking episode) (Haffner et al., 2003; NIAAA, 2004).

Gender was considered a statistical stratum variable. The following aspects of the individuals were evaluated as explanatory variables in both genders: sociodemographic characteristics (age, socioeconomic status [SES], education, occupation, and religion); drug use on the day of the interview (tobacco and illicit drugs—any marijuana, cocaine, ecstasy, crack, inhalants, ketamine, methamphetamine, other amphetamines, benzodiazepines, or hallucinogens); and practice of risk behaviors inside the nightclub (broke objects or got involved in a fight in the club, pushed or hurt someone in the club, kissed or attempted to have intercourse against a person’s will, someone upset you or hurt you in the club, someone kissed you or tried to have intercourse against your will, and drank and will drive at the exit of the nightclub) with options of yes (1) or no (0) as answers. To facilitate interpretation of results and have more precise estimates, some similar categories were grouped and renamed. The variable “drug use on the day of the interview” was separated into the following: use of illicit drugs (marijuana, cocaine, ecstasy, crack, inhalants, ketamine, methamphetamine, other amphetamines, benzodiazepines, or hallucinogens) and tobacco use; the variables “broke objects or got involved in a fight in the club” and “pushed or hurt someone in the club” were grouped and resulted in a new variable (“practice of violent behavior in the nightclub”). The remaining variables were modified only in their names: “kissed or attempted to have intercourse against a person’s will” became “experience of sexual harassment in the nightclub”; “someone upset you or hurt you in the club” became “victimization in the nightclub”; “someone kissed you or tried to have intercourse against your will” became “practice of sexual activity in the nightclub”; and the variable “drank and will drive at the exit of the nightclub” was modified to “drinking and driving (after leaving the nightclub).”

SES was evaluated as indexed in relation to a Brazilian highly standardized survey assessment of SES known as the Associação Brasileira de Empresas de Pesquisa (Brazilian Association of Research Agencies) index. This index (ABEP, 2012) is based on the education level of the head of the household, possession of various types of household goods (e.g., television sets), and the number of housekeepers. This scale was used to classify participants into standardized subgroups labeled A-E (in which A was the highest economic stratum). To improve the accuracy of estimates in the regression models, some categories with low frequencies were grouped. Therefore, for the SES variable, the C, D, and E classes were grouped; for the occupation variable, “unemployed” and “retired” were combined; for the age variable, the category

“42 years or more” was created, and “elementary school” and “no diploma” were combined in the same category.

Doses of alcohol consumed inside the nightclub were reported by the interviewees after looking at a figure that presented doses equivalence. A serving dose was defined as a 5-oz glass of wine, a 12-oz can of beer, or a 1.5-oz shot of liquor and the equivalence examples.

Data Analysis

Data were analyzed using Stata software version 12 (Stata-Corp, College Station, TX). We computed weights for nightclubs, patrons within a nightclub, and overall patron weights. Poststratification adjustments were made using the information about the sex of all customers present at each nightclub. According to data provided by the venues managers obtained from the patrons consumption cards, a total of 23,100 patrons were present in the 31 nightclubs on the days of data collection, 59% men and 41% women. Nonparticipation adjustment rates for the nightclub weights were also calculated. Descriptive and inferential statistics of the sampled patrons and nightclubs were computed using survey weight estimates. BrAC data measured at the entrance and exit of the nightclubs were described and compared by the chi-square test or Student’s *t*-test (for alcoholic variable dosing in mg/l). Student’s *t*-test was also used to compare doses of alcohol consumed inside the nightclub. For this analysis, we considered both the total respondents and only those who reported predrinking on the night of the interview. In both genders, predrinkers and non pre drinkers were compared according to sociodemographic characteristics, drug use on the day of the interview, and risk behaviors practiced inside the nightclub. The chi-square test was used for all comparisons. To identify the effects of predrinking on both genders, logistic regression models were adjusted using the risk behaviors (illicit drug use in the nightclub, tobacco use in the nightclub, practice of violent behavior in the nightclub, experience of sexual harassment in the nightclub, victimization in the nightclub, practice of sexual activity in the nightclub, and drinking and driving [after leaving the nightclub]) as the dependent variables, and predrinking as the independent variable. Predrinking (yes/no) is an independent variable, because it occurred before the risk behaviors. First the patrons engage (or not) in the predrinking and then they engaged (or not) in the risk behavior. First, the variables were analyzed separately by univariate logistic regression models. Then, we developed a multiple logistic regression model in which variables with $p < 0.20$ in the univariate analysis were included. From an initial multivariate model, variables without statistical significance ($p > 0.05$) were excluded stepwise to reach a final model with only the significant variables. The results were presented as odds ratios (ORs) and 95% CIs.

RESULTS

Of 2,422 respondents, the majority (60.7%, 95% CI = 48.2 to 71.9) were male. Predrinking was practiced by 41.3% ($n = 1,074$, 95% CI = 33.7 to 49.3) of the patrons at the day of the interview, 49.2% (95% CI = 42.7 to 55.8) were male predrinkers, and 29.0% (95% CI = 20.6 to 38.9) were female predrinkers ($p < 0.001$). The demographic characteristics of the predrinkers are presented in Table 1.

Table 2 shows the behaviors practiced in the nightclub on the day of the interview according to predrinking. For both genders, people who practiced predrinking before entering the nightclub were more likely to drink inside the nightclub compared to those who had not practiced predrinking that night: Therefore, 85.8% of male predrinkers versus 64.3% of

Table 1. Sociodemographic Characteristics of the Patrons (n = 2,422) According to Predrinking Status and Gender, São Paulo, 2013

Sociodemographic variables	Sex												
	Male						Female						
	Total (n = 1,476)		Predrinking (Yes) (n = 755)		Predrinking (No) (n = 721)		Total (n = 946)		Predrinking (Yes) (n = 319)		Predrinking (No) (n = 627)		
	Wgt%	95% CI	Wgt%	95% CI	Wgt%	95% CI	Wgt%	95% CI	Wgt%	95% CI	Wgt%	95% CI	p
Age group (years)													
18 to 25	58.0	45.7 to 69.4	58.9	47.4 to 69.4	57.3	42.6 to 70.7	70.3	60.0 to 78.7	66.9	51.8 to 79.2	71.6	60.7 to 80.4	0.147
26 to 33	27.8	20.8 to 36.0	27.1	20.6 to 34.7	28.5	20.0 to 38.7	20.5	14.9 to 27.6	25.9	16.1 to 38.8	18.3	12.3 to 26.3	
34 to 41	8.4	5.7 to 12.3	9.0	5.8 to 13.4	8.0	5.3 to 11.7	7.0	4.6 to 10.3	6.7	3.7 to 11.9	7.0	4.5 to 10.7	
42 to 49	4.0	1.7 to 9.3	4.4	1.6 to 11.0	3.8	1.7 to 8.3	2.0	0.9 to 4.2	0.2	0.0 to 1.0	2.7	1.3 to 5.6	
≥50	1.7	0.3 to 7.7	0.7	0.2 to 2.4	2.6	0.5 to 13.3	0.3	0.0 to 1.0	0.2	0.0 to 0.9	0.3	0.0 to 1.4	
Occupation													
Works	83.9	78.7 to 87.9	82.9	77.2 to 87.4	84.7	78.3 to 89.5	73.8	67.2 to 79.5	73.4	61.9 to 82.4	73.9	67.7 to 79.3	0.107
Studying	9.7	5.9 to 15.6	11.3	6.9 to 18.1	8.2	4.5 to 14.4	15.1	8.3 to 25.9	20.5	12.0 to 32.7	12.9	6.3 to 24.7	
Unemployed	6.0	4.5 to 7.9	5.6	3.9 to 7.9	6.4	4.1 to 9.8	11.0	7.6 to 15.7	6.0	2.5 to 14.1	13.1	8.9 to 18.9	
Retired	0.4	0.0 to 1.9	0.1	0.0 to 1.1	0.6	0.0 to 4.3	0	NE	0	NE	0	NE	
Living status													
Family of origin	65.7	57.3 to 73.3	64.2	55.3 to 72.2	67.3	58.2 to 75.2	73.0	63.2 to 80.9	69.5	54.5 to 81.3	74.3	65.4 to 81.6	0.446
Own family	6.0	3.8 to 9.3	7.3	4.5 to 11.7	4.8	2.7 to 8.2	8.6	3.6 to 18.8	9.5	3.6 to 22.6	8.2	3.5 to 17.9	
Alone	19.6	14.8 to 25.4	18.3	14.0 to 23.5	20.7	14.0 to 29.6	9.0	6.6 to 12.3	11.7	7.3 to 18.5	7.9	5.2 to 11.8	
Other	8.6	6.2 to 11.8	10.1	7.0 to 14.4	7.1	5.0 to 10.0	9.4	7.0 to 12.4	9.2	6.0 to 13.6	9.4	6.4 to 13.6	
Marital status													
Single	91.4	86.6 to 94.6	90.9	85.5 to 94.5	91.8	86.9 to 95.0	88.5	80.5 to 93.4	90.9	82.8 to 95.3	87.5	78.8 to 92.9	0.446
Married	6.3	3.7 to 10.5	6.9	3.7 to 12.2	5.8	3.4 to 9.7	7.6	4.0 to 13.7	7.7	3.5 to 16.2	7.5	4.1 to 13.4	
Other	2.2	1.2 to 4.0	2.2	0.9 to 4.7	2.3	1.2 to 4.6	3.9	2.3 to 6.6	1.4	0.5 to 3.9	5.0	2.8 to 8.7	
Social class													
A	27.1	20.4 to 35.0	31.7	24.5 to 39.9	22.7	15.8 to 31.4	23.7	14.5 to 36.3	27.3	15.8 to 43.0	22.2	13.6 to 34.1	0.016
B	53.6	49.7 to 57.4	48.7	43.0 to 54.3	58.3	53.3 to 63.2	53.7	49.5 to 58.0	58.4	48.3 to 67.7	51.9	45.8 to 57.8	
C/D/E	19.3	14.6 to 25.0	19.6	13.9 to 26.9	18.9	13.9 to 25.2	22.5	13.2 to 35.6	14.3	8.6 to 22.7	25.9	15.2 to 40.5	
Education													
Postgraduate	8.2	5.0 to 13.2	7.5	4.1 to 13.2	8.9	5.6 to 13.8	5.1	2.6 to 9.8	5.7	2.8 to 11.2	4.9	2.2 to 10.4	0.241
University	30.2	24.9 to 35.9	30.6	25.5 to 36.3	29.7	22.9 to 37.6	19.3	13.9 to 26.1	21.2	13.6 to 31.5	18.5	12.6 to 26.4	
High school	55.2	48.7 to 61.5	55.2	49.9 to 60.3	55.1	45.3 to 64.6	66.4	59.3 to 72.8	64.3	54.3 to 73.2	67.3	59.1 to 74.5	
Elementary school	5.9	3.3 to 10.5	5.8	2.8 to 11.9	6.0	3.5 to 10.2	8.5	5.5 to 12.8	6.9	3.7 to 12.3	9.2	5.8 to 14.2	
No diploma	0.4	0.1 to 1.5	0.7	0.1 to 3.3	0.1	0.0 to 0.6	0.6	0.1 to 2.3	1.8	0.3 to 9.9	0.1	0.0 to 1.2	
Religion	68.7	64.0 to 73.0	66.0	59.9 to 71.7	71.3	66.7 to 75.5	70.8	60.7 to 79.3	67.3	56.6 to 76.4	72.3	60.2 to 81.8	0.388

% Wgt, weighted percent; NE, not estimable.

Table 2. Risk Behaviors Practiced Inside the Nightclubs by Predrinking Status and Gender Among 1,833 Patrons in São Paulo, 2013

	Sex													
	Male						Female							
	Total (n = 1,117)		Predrinking (Yes) (n = 575)		Predrinking (No) (n = 542)		Total (n = 716)		Predrinking (Yes) (n = 224)		Predrinking (No) (n = 492)			
Wgt%	95% CI	Wgt%	95% CI	Wgt%	95% CI	Wgt%	95% CI	Wgt%	95% CI	Wgt%	95% CI	p		
Drank in the club	75.2	70.3 to 79.5	85.8	78.8 to 90.7	64.3	56.9 to 71.0	<0.001	73.7	65.0 to 80.9	88.9	83.8 to 92.5	68.2	57.6 to 77.2	<0.001
Use of other drugs in the club														
Marijuana	5.7	2.7 to 11.6	6.4	2.4 to 15.9	5.0	2.7 to 8.9	0.517	2.6	0.9 to 6.5	2.3	0.6 to 8.2	2.6	0.9 to 7.4	0.830
Cocaine	2.8	1.4 to 5.3	2.5	1.3 to 4.5	3.2	1.1 to 8.6	0.684	0.3	0.0 to 1.3	0.1	0.0 to 1.0	0.4	0.0 to 1.9	0.383
Ecstasy	6.3	2.3 to 16.0	7.9	2.7 to 21.0	4.7	1.9 to 10.9	0.024	2.5	0.8 to 6.7	2.2	0.6 to 7.1	2.6	0.8 to 7.6	0.798
Tobacco	20.5	15.2 to 27.0	24.6	20.6 to 29.0	16.3	8.8 to 28.1	0.119	16.2	11.0 to 23.0	19.0	10.8 to 31.2	15.2	10.6 to 21.1	0.309
Crack	0.2	0.0 to 1.7	0.2	0.0 to 1.7	0.3	0.0 to 1.7	0.829	0	0	0	0	0	0	-
Inhalants	2.8	1.1 to 6.6	3.4	1.4 to 8.1	2.2	0.6 to 6.7	0.340	1.2	0.3 to 3.9	2.0	0.5 to 6.6	0.9	0.2 to 3.1	0.010
Ketamine	4.5	1.1 to 16.0	4.3	1.0 to 15.7	4.7	1.2 to 16.8	0.615	0.9	0.1 to 4.2	0.6	0.0 to 4.8	1.0	0.1 to 5.4	0.670
Amphetamines	0.7	0.3 to 1.4	1.0	0.3 to 2.7	0.3	0.0 to 1.5	0.248	0.4	0.0 to 2.8	0.2	0.0 to 1.4	0.5	0.0 to 4.2	0.456
Hallucinogens	2.2	1.1 to 4.0	2.6	1.2 to 5.5	1.7	0.5 to 5.5	0.515	0.6	0.1 to 2.7	0.3	0.0 to 2.7	0.6	0.1 to 2.9	0.326
Broke objects or got involved in a fight in the club	1.7	1.0 to 2.8	2.4	1.5 to 3.7	1.0	0.4 to 2.8	0.100	0.5	0.1 to 1.6	0	0	0.6	0.1 to 2.2	0.375
Pushed or hurt someone in the club	7.0	5.2 to 9.4	6.9	4.6 to 9.9	7.3	4.3 to 12.0	0.854	6.0	3.7 to 9.5	7.3	3.9 to 13.1	5.5	3.1 to 9.3	0.375
Kissed or attempted to have intercourse against a person's will	4.7	3.0 to 7.2	5.5	3.5 to 8.5	4.0	1.9 to 7.6	0.334	3.0	1.3 to 6.5	5.8	2.5 to 12.6	2.0	0.8 to 4.9	0.007
Someone upset you or hurt you in the club	10.7	7.7 to 14.8	13.0	10.5 to 15.8	8.5	4.5 to 15.4	0.095	17.5	13.3 to 22.7	14.0	7.1 to 58.8	18.8	14.4 to 24.0	0.380
Someone kissed you or tried to have intercourse against your will	10.2	5.7 to 17.6	11.0	6.3 to 18.0	9.5	4.8 to 17.8	0.417	10.8	7.5 to 15.4	8.8	4.8 to 15.5	11.5	7.1 to 18.0	0.513
Drank and will drive at the exit of the nightclub	41.7	33.9 to 50.0	79.0	69.0 to 86.4	23.2	16.5 to 31.4	<0.001	41.5	22.0 to 64.1	79.3	53.8 to 92.6	36.6	16.6 to 62.5	0.008

% Wgt, weighted percent.

male nonpredrinkers drank inside the venue ($p < 0.001$); among females, 88.9% of predrinkers versus 68.2% of nonpredrinkers drank inside the nightclub on that day ($p < 0.001$).

Regarding the use of additional drugs inside the nightclubs, a different pattern was observed among predrinker patrons. There was a higher prevalence ($p = 0.024$) of ecstasy use among men who reported practicing predrinking (7.9%) compared to men who did not report predrinking that night (4.7%). Among female predrinkers, a higher prevalence of inhalant use was found compared to female nonpredrinkers (2.0% vs. 0.9%; $p = 0.010$).

Table 3 shows the effect of predrinking on risk behaviors if analyzed separately (unadjusted OR [aOR]) and if other independent variables were considered (adjusted OR). Among men, the practice of predrinking increased the chance of drinking and driving after leaving the nightclub (aOR = 6.9, $p < 0.001$). Among women, the practice of predrinking increased the chance of experience of sexual harassment in the nightclub (aOR = 2.9, $p = 0.010$).

The average BrAC measured by breathalyzer at the entrance of the nightclub was 0.12 mg/l (95% CI = 0.09 to 0.15 mg/l) in men and 0.07 mg/l (95% CI = 0.03 to 0.10 mg/l) in women ($p = 0.002$). Among respondents who reported having practiced predrinking, there was no difference between male and female BrAC ($p = 0.473$) with a mean of 0.24 mg/l (95% CI = 0.19 to 0.29 mg/l) in men and 0.22 mg/l (95% CI = 0.17 to 0.27 mg/l) in women. At the exit of the nightclub, there was no significant difference between genders in the average BrAC ($p = 0.895$), with an average level of 0.25 mg/l (95% CI = 0.20 to 0.30 mg/l) in men and 0.24 mg/l (95% CI = 0.16 to 0.32 mg/l) in women. Among predrinkers, the mean in men was 0.34 mg/l (95% CI = 0.27 to 0.41 mg/l) and 0.36 mg/l in women (95% CI = 0.30 to 0.42 mg/l) ($p = 0.633$).

When analyzing data considering the number of doses taken inside the nightclub, gender differences were not found among predrinkers (men = 4.7 ± 0.3 [doses \pm SD] vs. women = 4.0 ± 0.5 [doses \pm SD], $p = 0.157$). However, when the predrinking status was not considered in the analysis, men drank more alcohol doses than women inside the nightclub (men = 4.0 ± 0.3 [doses \pm SD] vs. women = 3.0 ± 0.3 [doses \pm SD], $p < 0.001$).

In the analysis of alcohol intoxication (BrAC ≥ 0.38 mg/l) (Table 4) at the entrance of the nightclub, 9.7% of the total respondents ($n = 258$) presented this standard dosage, with a higher percentage in men (12.3%) compared to women (5.6%) ($p = 0.006$). Among predrinker respondents, there was no difference between men and women ($p = 0.262$). At the exit of the nightclub, there was also no difference among the respondents ($p = 0.821$) and among predrinker respondents ($p = 0.551$).

Predrinker patrons were evaluated for signs of intoxication according to the observation of the interviewer at the time of entry to and exit from the nightclub. At the entrance of the nightclub, these signs were more frequent among male

respondents, with significant differences for exhale alcohol odor (17.9% of men vs. 8.4% women, $p < 0.001$) and “petrified” eyes (8.1% of men vs. 2.9% of women, $p = 0.008$). Most men and women, 55.6% (95% CI = 50.7 to 60.5) and 70.7% (95% CI = 56.3 to 82.0), respectively, said they were “not intoxicated” ($p = 0.058$). At the exit of the nightclub, these signs remained more frequent among male respondents, with significant differences for exhale alcoholic odor (27.0% for men vs. 15.9% for women, $p = 0.037$). If asked at the exit of the nightclub about the sensation of being intoxicated, 37.2% (95% CI = 29.2 to 46.0) of men and 48.1% (95% CI = 35.9 to 60.5) of women who practiced predrinking said they were “not at all intoxicated” ($p = 0.232$).

DISCUSSION

Data collected in this portal survey among nightclub patrons showed that almost half of the sample reported predrinking on the day of the interview, with a higher percentage of male predrinkers. At the entrance of the nightclub, a significant difference between the averages of BrAC among male and female patrons was observed. However, when considering only predrinkers, men and women showed similar BrAC at entrance and exit and similar proportion of alcoholic intoxication (BrAC ≥ 0.38 mg/l). Generally, risk behaviors were more frequent among male and female predrinkers compared to nonpredrinkers. The practice of predrinking increased 7 times the chance of “drinking and driving” after leaving the nightclub among men, and among women, this practice increased 3 times the chance of “experience of sexual harassment in the nightclub.”

Gender differences on alcohol consumption have become a topic of constant interest; men drink and are drunk more frequently than women (Holmila and Raitasalo, 2005; Kunt-sche et al., 2004; Wilsnack et al., 2009). Regarding the pattern in average alcohol consumption by men and women who practiced predrinking, in our study, women drank similarly to men, when considering their exit BrAC and doses consumed inside the nightclub. However, when not taking into consideration the predrinking status of the patron, men consumed more alcohol doses than women inside the nightclub, but presented same mean of exit BrAC and same proportion of alcohol intoxication than women in the exit, according to the biological measure. The differences of doses consumed inside the nightclub and exit BrAC among men and women predrinkers can be explained by Mancinelli and Guiducci (2004), Bennett and Williams (2003), and Flake and Forste (2006). These authors affirmed that regarding on equal terms of alcohol intake, women tend to have higher blood alcohol concentration than men, and also that women who abuse alcohol have more involvement than men in legal actions and in interpersonal approaches and are easily victims of violence. These effects are related to physiological gender differences in terms of body mass index and body water (the concentration of water in male body is considerably higher than that in female body, so after the same alco-

Table 3. Effects of Predrinking (Independent Variable) on Patrons' Practice of Risk Behaviors Inside the Nightclubs in São Paulo, 2013. Each Risk Behavior Was Considered as Dependent Variable in a Univariate (Unadjusted) and Multivariate (Adjusted) Logistic Regression Model

Subgroup/model	Risk behaviors inside the nightclubs													
	Illicit drug use in the nightclub	Tobacco use in the nightclub	Practice of violent behavior in the nightclub	Experience of sexual harassment in the nightclub	Victimization in the nightclub	Practice of sexual activity in the nightclub	Drinking and driving (after leaving the nightclub)							
	OR _{predrinking} (95% CI)	p-Value	OR _{predrinking} (95% CI)	p-Value	OR _{predrinking} (95% CI)	p-Value	OR _{predrinking} (95% CI)	p-Value	OR _{predrinking} (95% CI)	p-Value				
MALE (n = 1,109)														
Unadjusted	1.36 (0.91 to 2.09)	0.127	1.66 (0.88 to 3.18)	0.111	0.93 (0.46 to 1.90)	0.853	1.43 (0.69 to 2.93)	0.328	1.59 (0.93 to 2.73)	0.087	1.16 (0.81 to 1.67)	0.411	6.77 (4.38 to 10.47)	<0.001
Adjusted*	1.53 (0.94 to 2.49)	0.084	1.69 (0.94 to 3.03)	0.079	0.92 (0.46 to 1.82)	0.809	1.41 (0.70 to 2.84)	0.333	1.51 (0.89 to 2.56)	0.131	1.15 (0.81 to 1.63)	0.436	6.87 (4.09 to 11.54)	<0.001
FEMALE (n = 710)														
Unadjusted	1.23 (0.54 to 2.79)	0.617	1.32 (0.77 to 2.24)	0.302	1.35 (0.69 to 2.65)	0.370	3.01 (1.37 to 6.58)	0.006	0.70 (0.32 to 1.52)	0.375	0.74 (0.30 to 1.79)	0.510	1.85 (0.39 to 8.67)	0.431
Adjusted*	0.56 (0.27 to 1.20)	0.137	1.15 (0.59 to 2.25)	0.671	1.47 (0.64 to 3.40)	0.363	2.90 (1.28 to 6.57)	0.010	0.79 (0.35 to 1.80)	0.576	0.74 (0.29 to 1.91)	0.535	2.07 (0.44 to 9.67)	0.354

* Adjusted for sociodemographic characteristics, tobacco, and other drugs use in the day (before entering in the nightclub), practiced of binge drinking, and practiced of risky behaviors in the last 12 months. OR_{predrinking} = chance of having the practice of risky behaviors in the predrinking sample/chance of having the practice of risky behaviors in the nonpredrinking sample.

hol intake, alcohol concentration in the female blood is higher), sexual hormones, and activity of alcohol dehydrogenase.

Such as identified in our study, studies in the United States that observed same-day predrinking behavior showed that women's increases in the blood alcohol concentration were almost similar to men's (Paves et al., 2012; Read et al., 2010). Furthermore, according to Zamboanga and colleagues (2013), the habits in alcohol consumption are changing, especially among women, whose practice of predrinking is increasing in the past years. The reason of this remains unclear whether this is because female consumption is now viewed less negatively as a result of changes in women's cultural roles, or that women have actually changed their patterns of consumption, now that society no longer penalizes alcohol and other drugs use among women. This may be a reflection of the differences in gender identity, which particularly affects risk taking and risk perception, that is, male alcohol intoxication is closely connected to the socially required masculinity. A better understanding of the factors that drive these differences would facilitate the development of preventive strategies related to the problem of alcohol consumption for both genders (Calafat et al., 2003). In Brazil, for both genders, predrinking contributes significantly to high intensity drinking at the nightclub. Nevertheless, what most stands out is that women are looking to equal men in their behavior toward drunkenness and alcohol intoxication. What is not clear in our study and that emerges as a topic for future discussion is the reason why the pattern of alcohol intoxication inside the nightclub is similar among genders, but the practice of predrinking is more prevalent among men.

Moreover, gender differences in drinking in public settings may be associated with determining alcohol-related consequences associated with drinking in that setting, that is, these gender differences could influence specific consequences associated with drinking in that environment (Bond et al., 2010). In this sense, the results of our study showed that the practice of predrinking acts as possible risk factor inside the nightclub by increasing the chances of different risk behaviors for men and women. The abuse of alcohol consumption may facilitate or serve as justification for the occurrence of those behaviors; men and women are exposed to greater risks due to the influence of alcohol, but react differently by social and cultural issues. In our sample, alcohol seemed to influence more aggressive sexual behavior among women, perhaps by reducing their perception of risk or by reducing women's sexual shyness, which is created by a cultural sense in which it is expected that the woman be conquered and not be the conqueror. The authors Leonard and colleagues (2003) and Quigley and colleagues (2003) affirm that the risk of victimization can be particularly high in heavy drinking environments, so that the need to develop strategies to reduce sexual violence had become more pressing, especially regarding the female gender. For

Table 4. Alcohol Intoxication (Obtained from BrAC) Measured by Breathalyzer Among Patrons at the Nightclubs in São Paulo, 2013

	Sex												<i>p</i>
	Total				Male				Female				
	Total	<i>n</i>	%Wgt	95% CI	Total	<i>n</i>	%Wgt	95% CI	Total	<i>n</i>	%Wgt	95% CI	
	BrAC ≥ 0.38 mg/l												
Total participants													
At entrance	2,385	258	9.7	7.1 to 13.0	1,452	194	12.3	8.8 to 16.9	933	64	5.6	3.2 to 9.7	0.006
At exit	1,822	569	31.5	24.8 to 39.1	1,111	377	30.9	23.1 to 39.9	711	192	32.6	21.2 to 46.5	0.821
Among predrinker participants													
At entrance	1,060	251	22.8	17.9 to 28.6	745	188	24.3	17.7 to 32.3	315	63	19.1	13.8 to 25.8	0.262
At exit	795	373	44.3	36.0 to 53.0	572	275	43.4	34.0 to 53.2	223	98	47.2	36.5 to 58.2	0.551

% Wgt, weighted percent; BrAC, breath alcohol concentration.

Among the 2,422 patrons interviewed, 37 had missing data for BrAC test.

example, the authors Kelley-Baker and colleagues (2011) and Testa and Livingston (2009) had been studying this problem to develop interventions for alcohol-related problems focused on women, working with their awareness and the use of safety strategies to prevent victimization. What these authors have not considered is that these prevention programs usually face women as helpless victims; however, our study suggests that predrinking stimulates the role of women as a possible aggressor, actively seeking a sexual interaction in these establishments.

Among men, the practice of predrinking increased the chances of “drinking and driving” after leaving the nightclub, and these results were consistent with previous studies (Wilsnack et al., 2006) that showed a pattern over time among men’s abuse of alcohol and their involvement in alcohol-related risks, such as driving under the influence of alcohol. Epidemiological studies (Moskowitz and Fiorentino, 2000; Sleet et al., 2009) show that the changes in driving capacity, environmental awareness, and motor skills occur with levels at or higher than 0.2 g of ethanol per blood liter. As soon as blood alcohol concentration increases, the driver tends to not use the seat belt and drives with higher velocity. Several studies have shown that male drivers are more likely to become involved in traffic accidents if they ingest any amount of alcohol and decide to drive, particularly at night and on weekends (Hingson and Winter, 2003; Horwood and Fergusson, 2000). A study conducted by the Forensic Medicine Institute of São Paulo on alcohol consumption and traffic accidents revealed that of the 907 car accident victims studied, the majority (79.6%) were males, and positive blood alcohol concentration were more frequent among men (44.7%) than women (18.4%). It was also concluded that half of traffic accidents were associated with parties and bars and occur in the period from midnight to 6 AM on weekends (De Carvalho Ponce et al., 2011).

There are studies that affirm that young people usually practice predrinking with the main intention of getting drunk (Hughes et al., 2008), which complicates the design of interventions aimed at the awareness of alcohol effects in this

group. However, some authors (Graham et al., 2014; Jones et al., 2011) have been working on studies aimed at creating policies or strategies to reduce the risk of problems associated with alcohol consumption in bars and nightclubs, mainly in an attempt to reduce the level of alcohol intoxication. The intent is to decrease the episodes of violence and other risky behaviors associated with alcohol, particularly drinking and driving. These strategies may include the application of a test to determine how much a person is “drunk” using breathalyzer equipment; implementation and enforcement of consequences such as traffic tickets and use of advertising to ensure that there is a high risk of being caught and punished; and the political will to support these strategies.

Several country-level factors could have a role in the relationship between gender and alcohol consumption. To reduce the consequences associated with predrinking, such as the use of other drugs, drinking and driving, and sexual risk behaviors, it is important to implement public policies that have already been succeed and implemented in other places. Countries can develop effective alcohol control policies directly aimed at preventing or reducing alcohol consumption in the general population, including regulating distribution and availability of alcoholic drinks through restrictions, for example, control of alcohol sales to people who are already intoxicated could reduce total volume consumed as well as alcohol-related problems (Babor et al., 2010). However, it is important to include in Babor and colleagues’ (2010) conclusion the need of gender-tailored interventions, because predrinking is acting in a diverse way according to gender.

The main limitation of this study was the acceptance rate (66%) of the sampled nightclubs, which may have compromised the inclusion of particular categories of patrons. The 76% follow-up rate shows that a portion of the entrance sample was lost. However, to minimize the bias, nightclub and patrons lost to follow-up were corrected by weighting. Our hypothesis is that patrons who were drunk were more likely to leave the establishment without participating in the exit interview. Therefore, the number of nonintoxicated

patrons may have been overestimated. Another limitation is that the BrAC was only measured 2 times for each patron. Therefore, some of the participants may have engaged in binge drinking earlier in the night but stopped to drink a few hours before leaving the nightclub, and because of blood clearance, their binge drinking was not detected at the nightclub exit. Despite these limitations, this study has several strengths. The most important strength is that this is the first epidemiological study of predrinking in a developing country. The second strength is the acceptance rate of patrons at the entrance (79.1%) of nightclubs in one of the largest cities in the world and the largest city in the Southern Hemisphere.

In this study, we concluded that drinking before entering a nightclub is more prevalent among men; however, women who engaged in predrinking has a similar pattern of alcohol consumption and exit BrAC than predrinkers of the male gender. The fact that risk behaviors and illicit drug use were associated with predrinking but differ between genders suggests that a gender-specific approach should be used in tailored interventions to prevent alcohol-related harm in nightclubs.

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