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Prevalence of alcohol abuse and associated factors in a population-based study

Prevalência da dependência de álcool e fatores associados em estudo de base populacional

ABSTRACT

OBJECTIVE: To estimate the prevalence of alcohol abuse/dependence and identify associated factors among demographic, family, socioeconomic and mental health variables.

METHODS: A household survey was carried out in the urban area of Campinas, southeastern Brazil, in 2003. A total of 515 subjects, aged 14 years or more were randomly selected using a stratified cluster sample. The Self-Report Questionnaire and the Alcohol Use Disorder Identification Test were used in the interview. Prevalences were calculated, and univariate and multivariate logistic analyses performed by estimating odds ratios and 95% confidence intervals.

RESULTS: The estimated prevalence of alcohol abuse/dependence was 13.1% (95% CI: 8.4;19.9) in men and 4.1% (95% CI: 1.9;8.6) in women. In the final multiple logistic regression model, alcohol abuse/dependence was significantly associated with age, income, schooling, religion and illicit drug use. The adjusted odds ratios were significantly higher in following variables: income between 2,501 and 10,000 dollars (OR=10.29); income above 10,000 dollars (OR=10.20); less than 12 years of schooling (OR=13.42); no religion (OR=9.16) or religion other than Evangelical (OR=4.77); and illicit drug use during lifetime (OR=4.47). Alcohol abuse and dependence patterns were different according to age group.

CONCLUSIONS: There is a significantly high prevalence of alcohol abuse/dependence in this population. The knowledge of factors associated with alcohol abuse, and differences in consumption patterns should be taken into account in the development of harm reduction strategies.

KEY WORDS: Alcoholism, epidemiology. Risk factors. Socioeconomic factors. Cluster sampling. Morbidity surveys.

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RESUMO

OBJETIVO: Estimar a prevalência do abuso/dependência de álcool e identificar fatores associados entre variáveis demográficas, familiares, socioeconômicas e relativas à saúde mental.

MÉTODOS: Inquérito domiciliar na área urbana de Campinas, Estado de São Paulo, realizado em 2003. Indivíduos de 14 anos ou mais de idade (N=515) foram selecionados aleatoriamente, mediante amostragem estratificada por conglomerados e avaliados por entrevista com as escalas *Self-Report Questionnaire* e o *Alcohol Use Disorder Identification Test*. Foram calculadas as prevalências e realizadas análises logísticas uni e multivariada, razões de chance e intervalos de confiança.

RESULTADOS: As prevalências estimadas de abuso/dependência de álcool foram 13,1% (IC 95%: 8,4%;19,9%) nos homens e 4,1% (IC 95%: 1,9%;8,6%) nas mulheres. No modelo de regressão logística múltipla final, o abuso/dependência de álcool revelou-se significativamente associado com idade, renda, escolaridade, religião e uso de drogas ilícitas. As categorias que apresentaram as maiores razões de chance ajustadas foram: renda (entre 2.501 e 10.000 dólares, OR=10,29; superior a 10.000 dólares, OR=10,20), escolaridade inferior a 12 anos (OR=13,42), não ter religião (OR=9,16) ou ser de religião que não fosse a evangélica (OR=4,77) e ter usado drogas ilícitas em algum momento da vida (OR=4,47). Os padrões de consumo e de dependência diferenciaram-se segundo o grupo etário.

CONCLUSÕES: A prevalência de uso abusivo/dependência de álcool na população é considerável. O conhecimento dos fatores associados a tal comportamento e das diferenças de padrão de consumo deve ser levado em consideração na elaboração de estratégias de redução do dano.

DESCRITORES: Alcoolismo, epidemiologia. Fatores de risco. Fatores socioeconômicos. Amostragem por conglomerados. Inquéritos de morbidade.

INTRODUCTION

Moderate use of alcohol is beneficial to some health aspects, such as the reduction of mortality due to heart diseases and the association with favorable levels of various cardiovascular risk factors, according to the literature.[6] However, alcohol abuse has harmful consequences to health and is responsible for a large number of avoidable deaths.

Abusive alcohol intake produces different quality of damage: increased risk for liver cirrhosis, tumors in various sites, heart diseases, strokes and depressive disorders.[7] It is also considered a risk factor for suicidal behavior and is associated with affective and non-affective mental conditions.[12] A large number of traffic and work-related accidents and violence, including child abuse and domestic violence, are attributed to excessive alcohol intake.[10]

It is estimated 6% to 15% of the population seeking primary health care have alcohol abuse or dependence. This prevalence increases up to 61% among patients seeking specialized clinics or hospitals. However, physicians only detect alcohol abuse in one third of the patients with this condition.[1]

Studies have identified chromosome sites (chromosomes 9, 15 and 16) responsible for increased vulnerability to alcohol dependence.[16] Nevertheless, the epidemiological identification of the most susceptible sociodemographic segments of the population to alcohol dependence is essential to guide effective control policies and programs.

The utilization of an easy, fast, standardized and valid tool for diagnosing alcohol abuse conditions is important for promoting more commitment of health professionals to identifying alcohol abuse conditions and toward proposing appropriate interventions.[23,24] Moreover, monitoring alcohol consumption of different population segments is necessary to develop effective dependence control actions and harm reduction strategies.

In Brazil, epidemiological studies have identified point prevalence for alcohol disorders in the general population of 3% to 12%.[2,3,15,19,*] This wide range is probably due to the use of different instruments and methods, and also may reflect geographical variations. In fact, few studies on alcohol misuse using reliable instruments and investigating sociodemographic, clinical, and cultural factors have been conducted in Brazil. Mendoza-Sassi & Beria[19] (2003) conducted the first Brazilian population-based study using the Alcohol Use Disorder Identification Test (AUDIT) in a southern Brazilian city. They investigated the prevalence and associated factors in a representative sample of 1,260 subjects aged 15 years and over. In regard to the impact of socioeconomic level on the prevalence of alcohol abuse or dependence, different results have been found in Brazilian studies.[2,3,19,*] In general, alcohol abuse/dependence is considered higher in lower socioeconomic level.[19,*] Mendoza-Sassi & Beria[19] (2003) found higher risk of alcohol dependence in those with less favorable socioeconomic conditions. Yet Almeida-Filho et al[2] (2004), in a study conducted in Salvador, northeastern Brazil, found higher prevalence of high-risk alcohol consumption in upper social stratum and no statistical association with educational level.

In Brazil there is a lack of population-based studies comprising a broader range of psycho-social variables associated to alcohol abuse/dependence such as those linked to religion, family history and mental health comorbidity. The objective of the present study was to assess the prevalence of alcohol abuse and to identify associated factors among demographic social and health related variables.

METHODS

The study is derived from the Multi-center Intervention Study of Suicide Behavior (SUPRE-MISS) of the World Health Organization (WHO). It is a cross-cultural project carried out in eight countries (Brazil, Estonia, India, Iran, China, South Africa, Sri Lanka, and Vietnam) as part of a WHO initiative to prevent suicide, under the scientific supervision of the Australian Institute for Suicide Research and Prevention, Griffith University, Brisbane, Australia, and the National Center for Suicide Research and Prevention of Mental Ill-Health, Karolinska Institute, Stockholm, Sweden.[5,26]

The survey was carried out in the city of Campinas, located 100 km from the capital of the State of São Paulo, southeastern Brazil. In 2003, Campinas had an estimated population of one million inhabitants (98% living in the urban area; 78% aged 14 years and over). The survey included non-institutionalized individuals aged 14 years or more, living in the urban area of the city.

A minimum sample of 500 subjects was adequate to estimate a prevalence of 10%, with a 5% sampling error, a 95% confidence interval considering a design effect of 2. A stratified three-stage cluster sample was adopted, and sampling units were respectively: the census tract, the household and the individual.

The study used household and census tracts file from the Health Survey of the state of São Paulo (ISA-SP).** Campinas' census tracts were grouped into three strata, according to the percentage of heads of households with college degree: stratum A (over 25% of heads of households with college degree; totaling 278 tracts); stratum B (5% to 25% of heads of households with college degree, totaling 252 tracts); stratum C (less than 5% of heads of households with college degree, totaling 305 tracts). In the first stage, ten census tracts were drawn from each stratum. Field surveyors covered these tracts to compute all existing households, based on the outline with block limits from the Instituto Brasileiro de Geografia e Estatítisca (IBGE – Brazilian Institute of Geography and Statistics).

In the second stage, 20 households from each census tract were randomly selected using systematic sampling. The procedure resulted in 200 households per stratum, totaling 600 households. Finally, an individual aged 14 years or more from each household was selected. The household's residents were counted in a continuous sequence in increasing order of age until a random number was reached (previously defined and printed on the cover of the form), and then this subject was invited to participate.

The instrument applied was based on the European Parasuicide Study Interview Schedule (EPSIS) of the WHO/EURO Multicenter Study on Suicide Behaviour.[26] It contains the following sections: sociodemographic information, history of personal and family suicidal behavior, opinion on community problems, physical and mental health, contact with health services and questions related to the consumption of alcohol and drugs.[26]

Two psychometric scales were added to the local protocol: the AUDIT*** and the Self-Reporting Questionnaire (SRQ-20), both validated in Brazil.[15,18] The

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*** Méndez BE. Uma versão brasileira do AUDIT – Alcohol use Disorder Identification Test. [dissertação de mestrado]. Pelotas: Universidade Federal de Pelotas; 1999.

AUDIT identifies risk of alcohol abuse/dependence when its score (range 0–40) is equal to eight or over.[4,15] The SRQ-20 has 20 questions with yes/no answers to screen non-psychotic psychiatric morbidity. Score equal to or above eight, in a range from zero to 20, were used as an indication of psychiatric morbidity.[18]

Twelve interviewers were trained and made up to three attempts to interview the person who had been randomly selected in case the person was not at home. All interviews were carried out without the participation of third parties. Residential areas considered dangerous were surveyed in groups. The field research started in May and ended in July 2003.

The dependent variable was defined as a possible case of alcohol dependence/abuse in individuals who scored eight or more points in the AUDIT test. The prevalence of alcohol abuse was calculated using the past 12 months as a reference period.

The following independent variables were analyzed:

- Demographic and socioeconomic factors: age, sex, occupation, monthly income (in dollars), schooling (in years), marital status, marital separation, whom the interviewed lived with, if he/she had children;
- Variables related to religion, frequency of church attendance, if the individual considered him/herself a religious person;
- Mental health conditions: non-psychotic psychiatric morbidity, suicidal ideation in their lifetime, history of psychiatric treatment, use of illicit drugs, use of tranquilizers and frequency of alcoholic beverage consumption.

Bivariate analysis was used to compare the prevalence in the subcategories of each variable. Prevalences, odds ratios and 95% confidence intervals were calculated. A multiple logistic regression was performed including all variables with p-value lower than 0.20 in the bivariate analysis. Variables were included in the multiple logistic regression analysis in three consecutive steps: first demographic and socioeconomic variables, then variables related to family and religion and finally variables associated to mental health. Only variables with p-value lower than 0.05 remained in the final model.

Analyses were weighed so as to take into account the different probabilities of selecting individuals in the sample and the outlining effect. In each stratum, the weight given to a chosen individual in a given household of a certain census tract was the reverse of its likelihood of selection. Statistics were performed using the Stata software program, version 7.0.

Table 1. Prevalence (%) and odds ratio of alcohol abuse (AUDIT) by adults according to demographic and social variables. Campinas, southeastern Brazil, 2003.

Variable	N	Prevalence (%)	95% CI	Odds ratio	95% CI
Gender					
Male	199	13.1	8.4;19.9	3.53	1.33;9.36
Female	316	4.1	1.9;8.6	1	-
Age range (years)					
14–39	255	10.4	7.0;15.3	4.17	0.91;19.20
40–59	167	7.1	3.5;13.9	2.74	0.44;17.15
≥ 60	93	2.7	0.6;11.7	1	-
Occupation					
Working	262	12.1	8.1;17.6	1	-
Unemployed	42	9.5	3.8;22.1	0.77	0.26;2.22
Student	42	2.4	0.3;15.7	0.18	0.02;1.50
Retired	59	4.7	1.2;17.3	0.36	0.09;1.37
Housewife/others	109	1.5	0.2;11.5	0.12	0.01;1.01
Income (US$)					
None	127	2.5	5.8;10.2	1	-
1–2,500	188	8.4	4.6;14.9	3.55	0.67;18.87
2,501–10,000	146	14.4	8.5;23.1	6.49	1.21;34.70
≥ 10,001	54	7.1	3.1;15.1	2.93	0.57;15.04
Education (years)					
<12	439	9.3	6.4;13.2	3.92	0.79;19.45
12 or more	75	2.5	0.6;10.7	1	-

AUDIT: Alcohol Use Disorder Identification Test

All subjects signed a consent term. Information confidentiality was assured. The survey was approved by the Ethics Research Committee of Faculdade de Medicina of the Universidade Estadual de Campinas.

RESULTS

A total of 538 individuals were selected. There were 23 refusals to participate (4.2%), resulting in a final sample of 515 interviewees. The number of refusals was higher in stratum A, followed by B and C (17, five and one, respectively).

Alcohol abuse/dependence, as estimated by the AUDIT test, was seen in 8.4% (95% CI: 5.9%;11.8%) of the subjects, and the prevalence was 13.1% (8.4%;19.9%) among men and 4.1% (1.9;8.6%) among women.

Alcohol abuse was statistically associated with gender, occupation and income. The prevalence was significantly higher among men and those with income ranging from US$ 2,501 to US$ 10,000 and lower among housewives and other occupations (Table 1). The prevalence of abuse was significantly higher among those who lived alone or with other relatives and among those who did not have a religion or went to church less often; and the prevalence was also lower among those who perceived their neighbors as supportive (Table 2). The use of tranquilizers was not associated with alcohol abuse/dependence, but a strong association was found with the use of illicit drugs (Table 3).

The analysis of the answers to each item of the AUDIT test showed that 4.6% of the general population and 22.3% of those with positive AUDIT tests consumed alcoholic beverages four or more times a week. Those who consumed between seven and nine doses on a typical day were 2.8% of the general population and 32.4% of those with positive AUDIT tests. Among those who used alcohol inappropriately 51.6% consumed it from two to

Table 2. Prevalence (%) and odds ratios of alcohol abuse by adults (AUDIT) according to family characteristics and religion. Campinas, southeastern Brazil, 2003.

Variable	N	Prevalence (%)	95% CI	Odds ratio	95% CI
Marital status					
Single	148	11.4	6.7;18.9	1	-
Married/Lives with a partner	286	6.7	4.1;10.7	0.56	0.25;1.28
Widow/divorced	81	6.7	2.3;17.9	0.56	0.21;1.47
Marital separations					
No	428	8.1	5.5;12.0	1	-
Yes	87	9.9	4.9;18.9	1.23	0.52;2.92
Lives with whom					
With children only	43	1.5	0.2;11.2	1	-
Partner, with or without children, or with parents	386	7.9	5.1;11.9	5.61	0.65;48.65
Alone or with other relatives/friends	86	15.3	6.7;31.0	11.81	1.06;131.70
Have children					
No	160	9.3	4.9;16.7	1	-
Yes	355	7.9	5.2;11.9	0.84	0.37;1.92
Perceives neighborhood as supportive					
Yes	240	5.8	3.1;10.5	1	-
No	267	11.1	7.7;15.8	2.03	0.99;4.14
Religion					
Protestant	100	3.1	1.0;8.8	1	-
Catholic	345	8.7	5.5;13.5	3.01	0.80;11.33
Spiritualist	22	10.2	2.3;34.8	3.57	0.51;25.21
None	41	18.3	10.5;30.0	7.08	1.86;26.93
Church attendance					
At least once a week	218	4.6	2.2;9.5	1	-
1 to 3 times a month	113	7.1	3.1;15.5	1.58	0.53;4.76
Less than once a month	143	12.7	7.5;20.6	3.01	1.04;8.66
Considers oneself a religious person					
No	47	11.8	5.5;23.4	1	-
Yes	466	8.1	5.5;11.7	0.65	0.27;1.60

Table 3. Prevalence (%) and odds ratios of alcohol abuse (AUDIT) by adults according to mental health disorder. Campinas, southeastern Brazil, 2003.

Variable	N	Prevalence (%)	95% CI	Odds ratio	95% CI
SRQ-20 (presumable case)					
Negative	427	7.9	5.4;11.5	1	-
Positive	88	10.7	5.1;21.1	1.39	0.59;3.29
Suicidal ideation in life					
No	420	7.7	4.9;11.7	1	-
Yes	95	11.9	6.4;21.0	1.62	0.70;3.75
Having undergone psychiatric treatment					
No	434	9.1	6.3;13.0	1	-
Yes	81	3.8	1.1;12.2	0.39	0.11;1.46
Use of illegal drugs in their lifetime					
No	451	6.5	4.1;10.2	1	-
Yes	64	22.0	13.5;33.7	4.04	1.88;8.67
Use of tranquilizer in their lifetime					
No	448	8.2	5.6;11.8	1	-
Yes	67	10.2	4.3;22.1	1.27	0.48;3.33
Frequency of alcoholic beverage use					
Daily	26	41.0	20.3;65.5	2.11	1.50;2.97
Less than daily	489	6.9	4.6;10.1	1	-

SRQ: Self-Report Questionnaire

Table 4. Factors associated with alcohol abuse: variables that remained in the multivariate logistic regression model. Campinas, southeastern Brazil, 2003.

Variable	Adjusted OR	95% CI
Age group (years)		
14;39	1	-
40;59	0.50	0.19;1.33
≥ 60	0.20	0.06;0.73
Income (US$)		
None	1	-
1;2,500	4.50	0.76;26.57
2,501;10,000	10.29	1.87;56.59
≥ 10,001	10.20	1.38;75.54
Education		
<12	13.42	3.00;59.99
12 or more	1	-
Religion		
Evangelical	1	-
Others	4.77	1.29;17.65
None	9.16	2.42;34.65
Use of illicit drugs during their lifetime		
No	1	-
Yes	4.47	1.82;10.95

four times a month. Compared to youngsters, there was a greater proportion of adults and elderly who consumed it more often (four or more times) during the week.

In the multiple logistic regression model, demographic, socioeconomic and behavior variables retained their statistical significance. The prevalence of alcohol abuse/dependence was significantly higher among individuals of higher income groups (OR=10.2), with less than 12 years of schooling (OR=13,42), with no religion or religion other than Evangelical (OR=4.77) and among those who had used illegal drugs during their lifetime (OR=4.47). The prevalence was significantly lower among the elderly (60 years or more) (Table 4).

DISCUSSION

Some methodological limitations of the present study should be considered. Although the AUDIT is one of the most widely used scales to evaluate alcohol abuse/dependence, with recognized psychometric qualities,[14,15,19] there is still some debate. For example, the best cut-off point, which some argue that should be lower for women.[20]

The 8.4% prevalence of alcohol abuse/dependence estimated by the present study (13.1% for men and 4.1% for women) is above the average value of 6% that Galduroz et al[8] (2003) found in a survey performed in 1999. Their study[8] comprised people aged 12 to 65 years living in 24 cities with more than 200,000 inhabit-

ants in the state of São Paulo. It is also above the 5.9% (9.1% in men and 2.4% in women) observed in people aged 18 years or more in a survey conducted in four areas of the state of São Paulo. But it is similar to the findings of Mendoza-Sassi & Béria[19] (2003) who found a prevalence of 7.9%, with 14.5% for men and 2.4% for women in a state in southern Brazil.

As for the prevalence of high-risk drinkers, Almeida-Filho et al[2] (2004) found a prevalence of 2.3% for women and 12.4% for men in Salvador, northeastern Brazil. The higher frequency of alcohol abuse among men found in the present study is entirely consistent with that reported in the literature.[7,11,17]

The frequency was higher among young adults aged 14–39 years and lower among those aged 60 years or more. Other studies also point towards the reduction of alcohol abuse after 55 or 65 years of age.[2,19] The greater prevalence among adolescents and young adults is worrying and consistent with the observations of growing consumption of alcohol by adolescents. A study carried out among junior high, and high school students attending public and private schools in Campinas found that 11.9% of the students had consumed alcohol in at least 20 of the 30 days preceding the survey.[22] A survey conducted in 10 Brazilian capitals found that the frequent use of alcohol (six or more times per month) in students aged 10 to 18 years increased from 9.2%, in 1987, to 15%, in 1997.[9]

Although the literature points out that single, divorced, or widowed people generally consume more alcohol,[2,11,17,25] the present study did not find any association between marital status and alcoholism.

As in the present study, other authors have reported lower prevalence of alcohol abuse among those with more years of education.[11,17,25,*] Serdula et al[21] (2004), however, found more excessive consumption among more educated youngsters in the United States. Other studies have found no significant association with educational level.[2,3]

A larger number of positive AUDIT tests was seen among higher income individuals. Discrepant results regarding income and other socioeconomic variables have been seen in the literature. The most frequent findings refer to higher "average intake" in higher socioeconomic level, but higher prevalence of "abusive use" in segments of lower social condition.[17,19] Some authors,[2] however, have reported higher abusive alcohol use in the higher social stratum.

Studies have evidenced the association between mental disorders and excessive alcohol consumption.[12] This was not observed in the present study in the association found between alcohol abuse/dependence and the occurrence of common mental disorders assessed by the SRQ-20. However, as other studies in the literature,[12,22] the present study found strong association between the use of alcohol and illicit drugs.

Since ancient times, many cultures have used alcohol in their rituals and social events. Cultural norms may explain the occurrence of alcohol abuse mainly restricted to men. Religiousness seems to be a factor of protection towards abusive consumption of alcohol and other drugs.[13] This was also observed in the present study, particularly among Evangelicals. This suggests a probable protection effect of anti-alcohol norms preached by Evangelicals and of their social support network (family, friends, workmates, church mates) that discourages abuse.

The present study allowed to identify that alcohol abuse/dependence is associated with various factors. Demographic, socioeconomic and cultural variables outline contexts that facilitate unhealthy patterns of alcohol consumption. Abusive alcohol consumption was lower in the highest education and lowest income segments, as already discussed. Not having a religion substantially increased the likelihood of alcohol abuse but belonging to the Evangelical church was a condition determining the lowest prevalence. These findings emphasize the importance of studies to further explore religious affiliation and health-related behaviors. Distinct patterns of alcohol consumption by age groups were identified and although adults and elderly have higher frequency of alcohol intake, this consumption is moderate. In youngsters, however, alcohol abuse/dependence occurs mostly as sporadic drinking habits (weekly or at a low frequency) showing the importance of teen-oriented interventions, especially considering its association with illegal drugs.

Understanding the prevalence of alcohol use and the pattern of dependence is essential to establish surveillance actions and assess the impact of future intervention programs. Identifying the most vulnerable groups to dependence may guide more effective control actions and harm reduction strategies.

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