



Patterns of Alcohol Use among Patients Who Visited Community Emergency Care Services in Southwestern Brazil

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Authors' contributions

This work was carried out in collaboration between all authors. Author MAVL designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. Authors JLFS and LBL managed the analyses of the study. Authors KSL and SPB managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Alcohol is among the most frequently consumed drugs worldwide. However, identification and intervention measures for alcohol abuse have not yet been established. This article reports the results of applying the Alcohol Use Disorders Identification Test (AUDIT) in 463 patients from five centers for emergency care community in a large city in the interior of São Paulo. The relationship between the AUDIT risk-levels of alcohol use and the socio-demographic variables of individuals seeking treatment between August and November 2010 was also examined. The instrument was administered by seven nurses and six students nurses. Individuals with AUDIT scores ≥ 07 received brief counseling (BC). The main reasons for seeking emergency care were "headache", "pain", and "ill-being". Among the individuals in the study, 95.9% lived in the municipality where the data was collected, 40.7% had an incomplete elementary school education, and the percentage of alcohol dependence was lower among employed individuals (11.9%). The sample was composed of 61.1%

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men and 38.6% women. Among the men, 18.7% had scores suggesting dependence, and 48% exhibited hazardous drinking levels; the corresponding proportions among women were 3.3% and 16.7%, respectively. The mean age of the participants was 42 years, and 16.2% of the alcohol-dependent users were aged 30 to 49 years. Alcohol use was recorded as the cause of treatment for 3.4% of the individuals. The administration of the AUDIT in a community emergency care setting proved to be a useful for the early identification of high-risk drinkers.

Keywords: Alcohol; management substance-related disorders; drug use and abuse.

1. INTRODUCTION

Alcohol is one of the most frequently consumed drugs worldwide and is among the substances that cause the most harm to individuals in several areas of physical, mental, and social health. Health risks are related to and potentiated by the pattern of consumption [1].

In Brazil, a survey on alcohol consumption performed in 149 municipalities showed an approximately 10% increase in the number of drinkers of five or more drinks per occasion for the years 2006 to 2012, year of the last survey [2]. These results should serve as a warning for healthcare professionals about the importance of measures that can identify hazardous alcohol consumers and provide appropriate intervention. In the United States, the American College of Surgeons implemented screening for unhealthy alcohol use as a recommended standard practice in all levels of trauma centers starting in 2006. Furthermore, it has been suggested that some trauma centers should be able to intervene with individuals identified as problem drinkers and that their treatment and education should be part of the nurse's practice [3].

The use of scales, guides, or structured interviews has been proposed in psychiatric emergency assessments as a possible way to improve diagnostics [4]. Patients presenting substance use disorders (SUDs) are common among the individuals admitted to hospital emergency rooms. In a study performed in a municipality in Southeastern Brazil, 28.5% of health care delivery (1998 to 2004) was related to the clinical manifestations of SUDs [5]. In the United States, SUDs represented 8.5% of all care received in 2008 [6], whereas studies have reported that a high number of individuals with SUDs are admitted to psychiatric emergency services in European countries, with the proportion of acute psychiatric cases varying from 32% to 56% [7].

A pilot study realized too Ribeirão Preto city showed that patients attending the three community emergency care and one emergency medical hospital had the highest proportion of alcohol users in the city [7]. However, one of the main obstacles to applying measures to identify and intervene in this problem is the lack of personnel and training in mental healthcare. Knowledge acquired from formal education or later training has proved insufficient in both theory and in practice, there is a discontinuity in subsequent professional qualification programs, and working conditions are inadequate [8,9].

A Brazilian study [10] showed that the main difficulties in dealing with alcohol abuse in emergency care were lack of time, insufficient professional training and the belief that the issue should not be addressed in such environments. A similar pattern has been found among European nurses and other professionals, who affirmed that alcohol use is an

important health issue but said that they have not questioned individuals about their pattern of use. The reason health professionals gave for their lack of inquiry about alcohol use was insecurity about their own abilities to help the patient change his/her behavior [11].

The objective of this study was to identify patterns of alcohol use among patients who visited community emergency care services and to establish relationships between demographic variables, the reason for seeking treatment, and the risk level according to the AUDIT.

2. METHODS

2.1 Study Design and Setting

This study is a quantitative descriptive study in five community emergency care centers in a city with more than 600,000 inhabitants in inland São Paulo State, Southwestern Brazil. Since 1995, the health service network in this city has been divided into regions; each region provides various medical specialties and treats emergency patients. In this study, we refer to this service as “community emergency care”.

2.2 Sample

The study was performed with a convenience sample of 463 patients frequenting care received in the five community emergency care centers. In 2010, when the data were collected, the services provided of 2.182 treatments medium per day. The sampling was intentional in the sense that individuals were interviewed as part of the interviewer's possible collection flow, with one interviewer per shift. Convenience sampling is a non-probability sampling technique where subjects are selected because of their convenient accessibility and proximity to the researcher. Is a well-known procedure used to select individuals from a population [12]. Our sample is to be considered as “convenience” since we selected the five community emergency care centers and did not selected them at random.

2.3 Ethical Approval

The project was approved by the Health Secretariat of the city and by the Research Ethics Committee of the University of São Paulo.

2.4 Inclusion and Exclusion Criteria

Patients were included if they were seen at one of the five community emergency care centers, were aged 18 years or older, and were able to understand the questionnaire (AUDIT). Patients were excluded if they were severely injured or unwell, had a serious mental health problem, or were grossly intoxicated.

2.5 Procedure

A research team of seven nurses from the University of São Paulo at Ribeirão Preto College of Nursing and six undergraduate nursing students was trained during in June and July 2010 to administer the AUDIT and provide brief counseling (BC)[13], which aimed to sensitize patients to their use of alcohol; to offer advice to help patients change their

behavior if abusive or hazardous alcohol use was detected; and, if the individual was interested, to plan his/her referral to a specialized service.

The data were collected by the team according to a schedule, with the objective of screening individuals in different shifts, i.e., at least one interviewer from 7:00am-1:00pm, one from 1:00pm-7:00pm, and one from 7:00pm-10:00pm. Each shift was staffed at least seven times on different weekdays between August 27 and November 11, 2010, for a total of 136 shifts and 463 interviewed users.

The Alcohol Use Disorders Identification Test (AUDIT) is a diagnostic tool directed at high-risk drinkers that can encourage them to reduce or cease alcohol consumption and thus avoid its harmful consequences. The AUDIT also helps to identify alcohol dependence and certain specific consequences of harmful consumption. Additionally, the results of this instrument have been compared with changes in biological markers of alcohol use, such as gamma glutamyl and presents a specificity of 97.9% [14].

With regard to the reliability of the AUDIT in most studies this instrument presents Cronbach's alphas greater than or equal to 0,80 [13] and since its development has been significantly used in research on alcohol consumption with clinical samples of the general population and also recommended by the Ministry of Health for use in primary Health [15].

The AUDIT was specifically designed for non-specialized professionals and for a range of health settings, but with suitable instructions, it can also be self-administered or used by non-health professionals. Within this perspective, this work hypothesized that screening with the AUDIT would provide a more general patient evaluation and risk identification.

The AUDIT consists of 10 items that include questions to assess the amount, frequency, alcohol dependence and problems related to alcohol consumption [16]. The scores can range from 0 to 40, and the cut off indicating dangerous ingestion of alcohol [14].

The AUDIT [13,17] was used to assess alcohol consumption patterns, identify a risk group, and screen for possible alcohol dependence. In this study, the AUDIT was administered to patients at the community emergency care service who could be contacted by the research team. On that occasion, the patients also received BC [13].

In all cases of high-risk use, alcohol abuse, or alcohol withdrawal syndrome, the individuals or their guardians received BC [13] from the research team (BC included advice about high-risk drinking, alcohol dependency, treatment, and available therapy groups for individual and family follow-up in the community). Additionally, the health care staff members were informed of those who participated in these procedures.

2.6 Analysis

The collected data were processed using the Statistical Package for The Social Sciences (SPSS), version 17.0. Pearson's chi-squared tests were performed to assess the differences between ratios.

3. RESULTS

Regarding the sample's demographic characteristics, most of the interviewees lived in the city where the data were collected (95.9%), and almost half the interviewees did not

complete elementary school (44.7%). Further, the majority of the sample consisted of males (61.1%) who were employed (63.3%) and 45.8% were married.

Among the individuals who lived in the city where the data were collected, 18.5% were in the risk-level zone of alcohol consumption, with scores between 8 and 15 on the AUDIT, and approximately 11.9% were possibly dependent; *i.e.*, their AUDIT scores were ≥ 20 , which means that these individuals required a referral to a specialized service for treatment.

There was no relationship between risk level and education ($p \geq 0.05$) for education does not seem to have been a protective factor against dependence in the present study.

The main reasons those interviewed sought attendance were "headache, pain, and ill-being", followed by "accidents" and "heart and endocrine problems" (Table 1). Alcohol use was recorded as the cause of care received in 3.5% of the individuals, 81.3% of whom were possibly dependent (AUDIT ≥ 20).

The differences between the categories related to employment and the risk zone of the AUDIT are presented in (Table 2), which shows a statistically significant relationship between employment and the risk level for alcohol abuse. Among the employed individuals, the highest percentage was within the risk zone of 8-15 points (22.9%). However, the percentage of individuals with possible alcohol dependence (AUDIT ≥ 20) was lower in the group of employed individuals (11.9%) compared with unemployed (13%) and retired (14.9%) individuals. Employment, in this study, may be a protective factor for alcohol dependence ($X^2=23.496$, $Pr=0.001$).

The participants' mean age was 42 years in men and 43 years in women. The age range was also significantly related to the risk levels. Specifically, 15.6% of the individuals with possible alcohol dependence were within the age range of 30 to 49 years ($X^2=14.365$, $Pr=0.026$), as (Table 3) shows. Although the purpose of this article is not to explore the details of the significant relationship between age and AUDIT risk level, this relationship deserves to be highlighted. The association was significant; however, when age was compared with the four AUDIT risk levels, the significance disappeared when only the extremes of the scales were considered (low and high risk; $Pr=0.119$).

A significant association between gender and risk level was found that persisted among low- and high-risk patients and when patients were separated according to the four risk levels of alcohol abuse detected by the AUDIT. In all cases, the p value was 0.000; showing a statistically significant relationship between gender and risk level. Among men, 18.7% had levels of dependence, as opposed to only 3.4% of the women. Furthermore, 48.1% of men exhibited levels of alcohol abuse (AUDIT >7), as opposed to 16.8% of women, a difference that was also statistically significant ($Pr=0.000$).

Similarly, there was a statistically significant relationship between marital status and high-risk drinking (AUDIT >7). Among married individuals the index of possible dependence was 9.0%, as opposed to 18.2% in those unmarried, 19.2% in separated, and 24% in those who were divorced. However, the loss of a partner was not associated with the same pattern. When considering the relationships between AUDIT risk level zones and marital status, unmarried, separated, and divorced individuals exhibited a higher risk level compared to married or widowed individuals ($X^2=43.502$, $Pr=0.001$).

Regarding alcohol use in patients who had consumed alcohol regularly for more than three years, the longer the time since the last ingested dose, the lower the AUDIT score (AUDIT>7; Pr=0.000).

Table 1. Reasons individuals sought treatment at five community emergency care services and AUDIT risk level zone

Reason for care received	AUDIT risk-level zone									
	00 to 07		08 to 15		16 to 19		20 and above		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Alcohol use	1	6.3	2	12.5	0	0.0	13	81.3	16	3.5
Illegal drug use	3	50	1	16.7	2	33.3	0	0.0	6	1.3
Suicide attempts	3	42.9	3	42.9	0	0.0	1	14.3	7	1.5
Psychiatric emergencies	9	81.8	0	0.0	1	9.1	1	9.1	11	2.4
Gastric emergencies	20	58.8	6	17.7	2	5.9	6	17.7	34	7.3
Neurological emergencies	8	53.3	2	13.3	1	6.7	4	26.7	15	3.2
Accidents	35	57.4	14	23.0	6	9.9	6	9.9	61	13.2
Kidney and genitourinary emergencies	27	84.4	2	6.3	2	6.3	1	3.1	32	6.9
Respiratory and allergic emergencies	22	68.8	4	12.5	2	6.3	4	12.5	32	6.9
Heart and endocrine emergencies	33	75.0	6	13.6	1	2.3	4	9.1	44	9.5
Headache, pain and ill-being	76	61.8	34	27.6	2	1.6	11	8.9	123	26.6
Other	48	71.6	9	13.4	2	3.0	8	11.9	67	14.5
Not indicated	12	80.0	3	20.0	0	0.0	0	0.0	15	3.2
Total	297	64.2	86	18.6	21	4.5	59	12.7	463	100.0

Pearson's χ^2 (36)=120.477, Pr=0.000 City in inland São Paulo State, 2010

Table 2. Sample distribution of individuals from five emergency care services, according to employment and AUDIT risk-level zone

Employed	AUDIT risk-level zone							
	0-7		8-15		16-19		≥20	
	f	%	f	%	f	%	f	%
Yes	171	58.4	67	22.9	21	7.2	34	11.6
No	67	72.8	12	13	1	1.1	12	13
Retired	57	77	6	8.1	0	0	11	14.9

Pearson's χ^2 : 23.496, Pr=0.001; City in inland São Paulo State, 2010

Considering the time-course of alcohol consumption and the AUDI Trisk-level zones no statistically significant difference were found. However, a higher ratio, i.e., 35.3%, of the individuals who reported having consumed alcohol regularly for one to three years, as well

as 20.8% of the participants with six or more years of consumption, were within the risk levels of possible dependence (AUDIT>20).

Table 3. Sample distribution of patients from five emergency care services, according to age and AUDIT risk level zone

Age (years)	AUDIT risk-level zone							
	0-7		8-15		16-19		≥20	
	f	%	f	%	f	%	f	%
18-29	75	57.7	32	24.6	8	6.2	15	11.5
30-49	98	61.3	27	16.9	10	6.3	25	15.6
≥50	112	73.2	21	13.7	2	1.3	18	11.8

Pearson's χ^2 : 14.365, Pr=0.026; City in inland São Paulo State, 2010

4. DISCUSSION

The concept of risk-level zones of alcohol consumption assessed via the AUDIT makes it possible to determine long-term patterns of alcohol use and to better address the diverse types of alcohol consumption [18]. Assessing variables that might cluster within these risk zones (AUDIT≥7) can highlight aspects that should be considered when developing prevention and intervention programs.

In this study, most of the individuals, regardless of AUDIT scores were from the city where the data were collected. This might have occurred because the service where the data was acquired is divided into regions.

The predominance of male individuals with high-risk alcohol use is in agreement with the results of other published reports [19-21]. In a study performed in an emergency care unit, among the psychiatric diagnoses, substance use (alcohol was not distinguished from other drugs) was more frequently found in men (29.1%) than in women (2.8%) [22]. Another study on the prevalence of alcohol abuse and dependence in the population of São Paulo, using the CAGE questionnaire, alcohol abuse was prevalent in 52.9% of men and 26.8% of in women aged 20 to 59 years [22].

However, these data must be treated carefully. Specifically, a systematic review has warned that there is no solid evidence of differences between men and women with respect to the qualitative use of alcohol. Regarding the observed and still poorly understood differences, cultural aspects are thought to be heavily involved in determining these consumption patterns [23]. The gender differences in alcohol use are relevant to developing intervention programs and in calculating their cost.

However, the number of women who frequently consume alcohol has increased. National studies [2] have observed an increased use of alcohol among women and the development of a pattern of more frequent drinking among men. In 2006, a national study reported that approximately 29% of the female population drank alcohol. When the study was repeated in 2012, this number increased to 39%. Furthermore, the binge-drinking pattern increased from 36% to 49% within the above time period. Therefore, women are now considered an at-risk population, with growing indices of alcohol consumption and harmful drinking [2].

There was no relationship between educational level and drinking risk. This result may be due to the type of sampling used in this study, which may have introduced bias and disagrees with other research using other samples, such as a study performed in the south of Brazil, which showed a higher ratio of regular alcohol users among those with more than eight years of schooling [21]. The same pattern can be observed in a study performed among the urban population of Northeastern Brazil in which people with nine or more years of education exhibited a higher prevalence of alcohol consumption compared with the group with less education [24].

Another study from the southwest of São Paulo State has shown an inverse association with age and, a direct association between education and harmful alcohol consumption. In women, there was a direct association between alcohol abuse and education and a direct relationship with the marital status "single" [22].

The higher prevalence of frequent alcohol users among employed individuals that was observed in the present study corroborates with the findings of another study performed in a city in South Brazil, where frequent drinking was higher among employed individuals [21]. However, it is important to note that in the present study, although frequent drinking was more common in the group of employed individuals, the dependence indices (AUDIT>20) were lower compared with those of unemployed or retired individuals.

This study shows that alcohol consumption was infrequently mentioned as the primary reason for seeking medical care. However, among individuals who reported seeking treatment because of alcohol consumption, 81.3% exhibited AUDIT scores ≥ 20 . Additionally, among individuals within the aforementioned score range, neurological complications comprised 26.7% of the reasons for seeking treatment, followed by gastric problems (17.7%) and suicide attempts (14.3%).

Furthermore, regardless of there a son for emergency treatment, alcohol abuse (AUDIT>7) was detected early in a significant portion of the participants (35.9%), and possible dependence was detected in 12.7% of the individuals who sought treatment in general. Most of the alcohol users were male and aged 30 to 49 years.

Among the limitations of the present study, the fact that the nurses who administered the AUDIT were a small and external team stands out as this factor hampers an evaluation of whether the AUDIT could be realistically incorporated into these services' standard health evaluation procedures. Another limitation is that not all of the individuals who sought treatment could be addressed because of the dynamics and conditions of the services (high individual volume, the need for fast treatment, and few appropriate spaces for establishing private contact). Regarding about the sample, one disadvantages are the risk that the sample might not represent the population as a whole, and it might be biased by volunteers.

5. CONCLUSION

Despite its limitations this study suggests that administration of the AUDIT in urgent and community emergency care settings has proven useful for the detection of high-risk drinkers. Detection can potentially lead to an increase in their awareness about the risk associated with their consumption patterns. However, further studies are required in order to determine whether such an approach could be transparently included in the routine care provided by these services. The use of AUDIT in community emergency services find a lot

more cases of problematic alcohol use that what is addressed in treatment as usual. The finding is potentially very important because of the large number of affected patients and the importance of alcohol misuse for the individuals, their families and the community.

CONSENT

All authors declare that written informed consent was obtained from the patient (or other approved parties) for publication of this case report and accompanying images.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Rehm J, Baliunas D, Borges GL, Graham K, Irving H, Kehoe T, et al. The relation between different dimensions of alcohol consumption and burden of disease: An overview. *Addiction*. 2010;105(5):817-43.
2. Laranjeira R, Madruga CS, Pinsky I, Caetano R, Mitsuhiro S. LENAD_ALCOOL_Resultados-Preliminares.pdf 2013. Available:http://inpad.org.br/wpcontent/uploads/2013/04/LENAD_ALCOOL_Resultados-Preliminares.pdf.
3. Surgeons ACo. FAQ for Resources for Optimal Care of the Injured Patient: 2006 - optimalcare.pdf 2013. Available at: <http://www.facs.org/trauma/optimalcare.pdf>.
4. Way BB, Allen MH, Mumpower JL, Stewart TR, Banks SM. Interrater agreement among psychiatrists in psychiatric emergency assessments. *Am J Psychiatry*. 1998;155(10):1423-8.
5. Barros REM, Marques JMA, Carlotti IP, Zuardi AW, Del-Ben CM. Short admission in an emergency psychiatry unit can prevent prolonged lengths of stay in a psychiatric institution. *Rev. Bras. Psiquiatr*. 2010;32(2):145-151.
6. Administration S-SAAmHS. Results from the 2008 NSDUH: National Findings, SAMHSA, OAS: of Prescription Drugs; 2013. Available at: <http://www.samhsa.gov/data/nsduh/2k8nsduh/2k8Results.htm>.
7. Flovig JC, Vaaler AE, Morken G. Substance use at admission to an acute psychiatric department. *Nord J Psychiatry*. 2009;63:113-119.
8. Luis MAV, Lunetta ACF, Ferreira PS. Protocol for assessing alcohol withdrawal syndrome by nursing professionals in emergency services: A pilot test. *Acta Paulista de Enfermagem*. 2008;21:39-45.
9. Saraceno B, van Ommeren M, Batniji R, Cohen A, Gureje O, Mahoney J, et al. Barriers to improvement of mental health services in low-income and middle-income countries. *The Lancet*. 2007;370(9593):1164-74.
10. Segatto ML, Pinsky I, Laranjeira R, Rezende FF, Vilela TdR. Screening and brief intervention for alcoholic patients treated in emergency rooms: Prospects and challenges. *Cad. Public Health*. 2007;23:1753-62.
11. Hodgins DC, El-Guebaly N, Addington J. Treatment of substance abusers: single or mixed gender programs? *Addiction*. 1997;92(7):805-12.
12. Creswell JW. *Research design: Quantitative, qualitative and mixed methods approaches*. Sage Publications, CA (4th ed); 2014.

13. Brazil Ministry of Health Tracking: Notebooks Primary Care. [Internet]. Brasilia: Ministry of Health Care; 2010.
Available at: http://189.28.128.100/dab/docs/publicacoes/cadernos_ab/abccad29.pdf.
Acessado em: 04 abr. 2014.
14. Meneses-Gaya C, Zuardi AW, Loureiro SR, Crippa JAS. Alcohol Use Disorders Identification Test (AUDIT): An updated systematic review of psychometric properties. *Psychol Neurosci*. 2009;2(1):83-97.
15. Dolman JM, Hawkes ND. Combining the AUDIT questionnaire and biochemical markers to assess alcohol use and risk of alcohol withdrawal in medical inpatients. *Alcohol Alcohol*. 2005;40(6):515-9
Available: <http://www.ncbi.nlm.nih.gov/pubmed/16103035> (Epub 2005 Aug 15).
16. Martins RA, Manzatto AJ, Cruz LN, Poiate SMG, Scarin ACCF. Using the Alcohol Use Disorders Identification Test (AUDIT) for identification of alcohol consumption among high school students. *Interam J Psychol*. 2008;42(2):307-16.
17. Shevlin M, Smith GW. The factor structure and concurrent validity of the Alcohol Use Disorder Identification Test based on a nationally representative UK sample. *Alcohol & Alcoholism*. 2007;42:582–587.
18. Anderson P, Scotte E. The effect of general practitioners' advice to heavy drinking men. *Brit J Addic*. 1992;87:1498–1508.
19. Rist F, Glöckner-Rist A, Demmel R. The alcohol use disorders identification test revisited: Establishing its structure using nonlinear factor analysis and identifying subgroups of respondents using latent class factor analysis. *Drug Alcohol Depend*. 2009;100(1-2):71-82.
20. Moretti-Pires RO, Corradi-Webster CM. Adaptation and validation of the Alcohol Use Disorders Identification Test (AUDIT) for a river population in the Brazilian Amazon. *Public Cad. Saúde, Rio de Janeiro*. 2011;27(3):497-509.
21. Bortoluzzi MC, Traebert J, Loguercio A, Kehrig RT. Prevalence and alcohol user profile in adult population in a southern Brazilian city. *Hist. Collective Health*. 2010;15(3):679-685.
22. Guimarães VV, Florindo AA, Stopa SR, César CLG, Barros MBdA, Carandina L, et al. Alcohol abuse and dependence in adults in the State of São Paulo, Brazil. *Brazilian Rev. Epidemiology*. 2010;13:314-25.
23. Fachini A, Furtado EF. Gender differences in alcohol use expectations. *Rev. Psychiatric Clinic*. 2012;39:68-73.
24. Ferreira LN, Sales ZN, Casotti CA, Bispo Júnior JP, Braga Júnior ACR. Alcohol consumption profile and associated factors in a city in Northeast Brazil. *Cad. Public Health*. 2011;27:1473-86.

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