

# Prevalence and Pattern of Alcohol Consumption using Alcohol Use Disorders Identification Test (AUDIT) in Rural Tamil Nadu, India

GANESH KUMAR S.<sup>1</sup>, PREMARAJAN K.C.<sup>2</sup>, SUBITHA L.<sup>3</sup>, SUGUNA E.<sup>4</sup>, VINAYAGAMOORTHY<sup>5</sup>, VEERA KUMAR<sup>6</sup>

## ABSTRACT

**Background:** There is a paucity of information on prevalence and pattern of alcohol consumption in India.

**Aim:** To assess the prevalence and pattern of alcohol consumption in a rural area of Tamil Nadu, India.

**Material and Methods:** A community based, cross sectional study was conducted among 946 subjects who were aged 10 years and above, in rural Tamil Nadu, India. Data on alcohol use was collected by using 'Alcohol Use Disorder Identification Test' (AUDIT) scale. Data on pattern and associated factors like socio-demographic details, smoking, tobacco chewing and chronic diseases were collected by using a structured questionnaire.

**Statistical Analysis:** Data was analysed by univariate and multiple logistic regression analysis and information was depicted in percentages or proportions. A p value of less than 0.05 was considered as significant.

**Results:** Overall, the prevalence of alcohol use was found to be 9.4%. Prevalence was more among males (16.8%) as compared to that among females (1.3%). Mean age at initiation was 25.3  $\pm$ 9.0 years. Multiple logistic regression analysis revealed that middle age (15–44 years) (OR=3.56), male gender (OR=11.23), illiteracy (OR=6.16), lower education levels (OR=2.57) and smoking (OR=17.78) were independently associated with alcohol use. Among those who used alcohol, 29.2% (26) were possible hazardous drinkers, 33.7% (30) had a probable alcohol dependence and 56.2% (50) had experienced harmful effects, based on AUDIT item analysis.

**Conclusion:** Prevalence of alcohol use is high, especially among males. Health educational interventions among those who are at a higher risk and management of alcohol dependent subjects, may help in reducing the burden of alcohol use in this area.

**Key words:** Prevalence, Alcohol use, AUDIT

## INTRODUCTION

Alcohol use is an important public health problem, especially in developing countries like India. There was a marked variation between World Health Organisation sub-regions on average volume of alcohol consumption and patterns of drinking. Average volume of drinking was highest in established market economies in western Europe and the former socialist economies in the eastern part of Europe and in north America and it was lowest in the eastern Mediterranean region and parts of southeast Asia, including India [1]. A recent study highlighted that in India, health loss from alcohol will grow even larger, unless effective interventions and policies are implemented to reduce these habits [2].

Very few community-based studies have been conducted on the prevalence of alcohol use in India [3–6]. There is a paucity of data on pattern and associated factors of alcohol use, which may be different in different geographical locations. Such studies will be useful for understanding the problem of alcohol use and for taking specific interventional measures at the community level. So, we conducted a cross sectional study to determine the prevalence of alcohol use, its associated factors and pattern of alcohol use in rural Tamil Nadu, southern India.

## MATERIAL AND METHODS

### Setting and Study Design

This cross sectional study was conducted during August to October 2012 in Vanur village of Vanur Taluk, in the Villupuram district of Tamil Nadu. Vanur village, with a population of 1500, comes under Vanur Commune Panchayat (with a total population of 9000).

### Sample Size Estimation

Minimum sample size required was 1000 subjects, based on 10% prevalence rate [7], a precision of 20% and a non-response rate of 10%. We decided to include residents who were aged 10 years and above, from the selected area, as study subjects [7].

### Study Tool

After obtaining their informed consent, the respondents were interviewed by using a structured questionnaire. Data on socio-demographic details and presence of any chronic morbid conditions were collected. Data on consumption of alcohol and tobacco was also collected. Socio-economic status was assessed, based on the modified BG Prasad classification (year 2004) scale. A history of smoking or tobacco chewing in the preceding month of the survey was considered for presence of smoking or tobacco chewing habits. A subject who consumed alcohol in the past 12 months was taken as the criteria for defining alcohol use. A pre-tested and validated AUDIT (Alcohol Use Disorders Identification Test) questionnaire was used to assess the pattern of alcohol use [8,9]. This was translated to the local language (Tamil) and it was translated back into English to ensure its reliability and validity. Data on hazardous level drinking (items: frequency of drinking, quantity and frequency of heavy drinking), dependence symptoms (items: an impaired control over drinking, an increased salience of drinking and morning drinking) and harmful alcohol use (items: guilt after drinking, blackouts, alcohol-related injuries and others which were concerned with drinking) were assessed, based on the scoring of above items in respective categories. Total scores of 8 or more were recommended as indicators of hazardous and harmful alcohol use, as well as possible alcohol dependence. A pilot test was conducted

before initiation of the study, to look for the feasibility of administration of questionnaire.

## Method of Data Collection

Prior permission was obtained from the village president and local leaders for conducting the study. A village leaders meeting was conducted, during which the purpose of the study methods which had to be adopted and the possible implications of the results were discussed. Following the village leaders meeting, village mapping and social mapping of the area was done, in order to know the study area and to plan for data collection. Data was collected by making house to house visits and interviewing the subjects by using the questionnaire. Informed consent was obtained from the study subjects. If the designated house was locked during the visit, household members in the next house were considered as study subjects. This study was done as a part of a community diagnosis posting for medical students, who were given training on administration of questionnaire and data collection process, under the supervision of the investigators.

## DATA ANALYSIS

Data was entered and analysed by using SPSS (Statistical Package for Social Sciences) version 16.0 for Windows. The findings were expressed in terms of proportions and mean, SD. A univariate analysis was carried out to test the association between socio-demographic and other factors and alcohol use. To determine the independent effect of various factors on alcohol use, a multiple logistic regression analysis was performed and their significance was estimated in terms of adjusted Odds Ratio and its 95% confidence interval. P values of less than 0.05 were considered as significant.

## RESULTS

A total of 946 subjects who were in the age group of 10 years and above were analysed, with a response rate of 94.6%. Most of the subjects were in the 15–44 year age group (497, 52.5%). Overall, the prevalence of alcohol use was found to be 9.4% and prevalence of hazardous or harmful use of alcohol was 3.7% (based on the cut off value of  $\geq 8$  on AUDIT). Mean age at initiation was found to be 25.3 years (SD=9.0). Two thirds of alcohol users belonged to the age group of 15–44 years (59, 66.3%). Around 1/3<sup>rd</sup> (32.6%) of them had a preference for local arrack [Table/Fig-1].

Prevalence of alcohol use was more among males (16.8%) as compared to that in females (1.3%). Male gender, lower education and income levels, tobacco use, smoking and presence of chronic diseases were found to be significantly associated with alcohol use on univariate analysis [Table/Fig-2]. A multiple logistic regression analysis revealed that adult age group (15–44 years) (OR=3.56), male gender (OR=11.23), illiteracy (OR=6.16), lower education levels (OR=2.57) and smoking (OR=17.78) were independently associated with alcohol use [Table/Fig-3].

It was seen that a majority (60.7%) of the alcohol users belonged to the risk zone level 1, on AUDIT scores. On analysis, as per the domains and item content of AUDIT for severity of alcohol use, it was observed that 56% fell in the pattern of harmful alcohol use. Among the current users of alcohol, around 30% and 33.7% of them had hazardous drinking levels and dependency levels respectively.

## DISCUSSION

Few studies have been conducted in the past, to determine the pattern of alcohol use in general population in India [3-6,10–12]. A recent study which was done in a slum area in Kolkata among men, reported the prevalence of alcohol consumers to be 65.8% [3], while a Vellore study reported that alcohol use in the past year was 34.8% [4]. A study which was done in Faridabad showed the prevalence of alcohol use to be 24.6% among men, while none of the women had used alcohol [6]. In contrast, our study showed that

prevalence of alcohol use was 1.3% among females.

In contrast to our findings, studies in other countries showed higher prevalence rates of alcohol use. A study from Russia found that 75% of the men drank spirits [13], while a Thailand study which was done among subjects who were aged 12–65 years, showed the prevalence of current drinkers to be 28.6% [14]. A study which was done in Finland showed the prevalence of hazardous drinking to be 5.8% [15]. The difference which was observed in prevalence may be due to difference in the exposure status of associated risk factors in different geographical locations. Definition and instrument which were used to define alcohol use, age group which was studied, methodology which was adopted and urban-rural difference may be the factors which are responsible for this varied observation.

Male gender and adult age group were found to be independently

Characteristics	Number (%)
Type of alcohol preference	
Beer	36 (40.4)
Brandy	12 (13.5)
Arrack	29 (32.6)
Wine	7 (7.9)
Others (Mixed)	5 (5.6)
Risk level scoring	
Zone 1 (0-7)	54 (60.7)
Zone 2 (8-15)	22 (24.7)
Zone 3 (16-19)	9 (10.1)
Zone 4 (20-40)	4 (4.5)

[Table/Fig-1]: Characteristics of alcohol use among the subjects (n=89)

Associated factors	Total number of subjects	Number of subjects with alcohol use (%)	$\chi^2$ , p value
<b>Age</b>			28.307, <0.001*
10-14	211	0 (0)	
15-44	497	59 (11.9)	
45-59	142	18 (12.7)	
$\geq 60$	96	12 (12.5)	
<b>Sex</b>			65.985, <0.001*
Male	495	83(16.8)	
Female	451	6 (1.3)	
<b>Education</b>			9.605, 0.008*
Illiterate	102	13(12.7)	
1 <sup>st</sup> to 10 <sup>th</sup> standard	562	62(11.0)	
>10 <sup>th</sup> standard	282	14(5.0)	
<b>Monthly per capita income (in Rupees)</b>			15.128, 0.004*
$\geq 2756$ (Class1)	60	12(20.0)	
1376-2755 (Class 2)	502	34(6.8)	
826-1375 (Class 3)	198	20(10.1)	
411-825 (Class 4)	148	20(13.5)	
$\leq 410$ (Class 5)	38	3(7.9)	
<b>Tobacco chewing</b>			43.7999, <0.001*
Yes	50	18(36.0)	
No	896	71(7.9)	
<b>Smoking</b>			274.7, <0.001*
Yes	55	40(72.7)	
No	891	49(5.5)	
<b>Chronic disease</b>			5.24, 0.02*
Yes	86	14(16.3)	
No	860	75(8.7)	

[Table/Fig-2]: Associated factors of alcohol use among the study subjects (n= 946)

\*P value less than 0.05 is considered as significant.

associated with an increased risk of alcohol use in another study [14]. Similarly, it was found that illiteracy and lower educational levels were associated with an increased risk of alcohol use in the general population [4]. Various studies have shown that smoking was one of the important factors which was associated with alcohol use, as

Variables	Odds Ratio Adjusted (95%CI)	p value
<b>Age</b>		
15-44	3.562 (1.407-9.014)	0.007*
45-59	2.109 (0.775-5.741)	0.144
≥60	–	–
<b>Sex</b>		
Male	11.231 (4.539-27.791)	<0.001*
Female	–	–
<b>Education</b>		
Illiterate	6.163 (2.144-17.716)	<0.001*
1st to 10th standard	2.573 (1.255-5.275)	0.01*
>10th standard	–	–
<b>Monthly family income (in Rupees)</b>		
≥2756 (Class 1)	1.954 (0.388-9.831)	0.417
1376-2755 (Class 2)	1.784 (0.412-7.714)	0.439
826-1375 (Class 3)	2.023 (0.447-9.158)	0.360
411-825 (Class 4)	1.287 (0.284-5.846)	0.743
≤ 410 (Class 5)	–	–
<b>Tobacco chewing</b>		
Yes	2.137 (0.821-5.563)	0.12
No	–	–
<b>Smoking</b>		
Yes	17.783 (8.285-38.167)	<0.001*
No	–	–
<b>Chronic disease</b>		
Yes	1.517 (0.67-3.432)	0.317
No	–	–

**[Table/Fig-3]:** Correlates of alcohol use: Multiple Logistic Regression analysis

\* p value less than 0.05 is considered as significant.

was seen in our study also [7, 16, 17]. However, income was not found to be associated with alcohol use, as was found in another study [4]. A study from Vellore reported that hazardous alcohol use in the past year was 14.2% as compared to a 30% use in our study [4]. A study among industrial workers in Goa showed the prevalence of hazardous drinking to be 21% [10], while another study which was done in the same place among general practice attendees, showed the prevalence of harmful drinkers to be 8.2% [12]. Another study which was done in north India showed that 48.5% of alcohol users had ≥8 AUDIT scoring, which is slightly higher than that in our study [11]. AUDIT is as an epidemiological tool that can be used in surveys of health clinics, health service systems, and general population samples and it was developed as an international instrument. It is one of the best screening instruments for alcohol consumption and for related risks in primary care settings and in community surveys. AUDIT scores between 8 and 15 (zone II – medium level of alcohol problems) are most appropriate for simple advice which is focused on the reduction of hazardous drinking; while scores between 16 and 19 suggest a brief counseling and a continued monitoring. AUDIT scores of 20 or above warrant a further diagnostic evaluation for alcohol dependence. Health education sessions on harmful use of alcohol and referral services were conducted among the village population at the end of the survey. This community based, cross sectional study gives valuable information on alcohol use in the general population with the use of a standard instrument. Such data can be beneficial in formulating

strategies for reducing alcohol use in the community and for offering support services. This study has its own limitations. An in depth evaluation of the reasons for initiation of alcoholism was not done and the past drinking profile was not assessed due to feasibility constraints. There was under reporting, which was due to a recall bias. Longitudinal studies will be required to look further into the associated factors of alcohol use and its consequences.

## CONCLUSION

Alcohol use is an important public health problem in this area, especially due to the high prevalence rate and a larger involvement of adult age group. Prevalence of alcohol use is high, especially among males. Health educational interventions and proper treatment may help in reducing the burden of alcohol use in this area.

## ACKNOWLEDGEMENT

We thank the President of the village, other village leaders and study participants for their co-operation and the students of 5<sup>th</sup> semester for helping in data collection.

## REFERENCES

- [1] Rehm J, Rehm N, Room R, Monteiro M, Gmel G, Jernigan D et al. The global distribution of average volume of alcohol consumption and patterns of drinking. *Eur Addict Res.* 2003;9:147-56.
- [2] Ramadas K, Sauvaget C, Thomas G, Fayette JM, Thara S, Sankaranarayanan R. Effect of tobacco chewing, tobacco smoking and alcohol on all-cause and cancer mortality: a cohort study from Trivandrum, India. *Cancer Epidemiol.* 2010 ;34:405-12.
- [3] Ghosh S, Samanta A, Mukherjee S. Patterns of alcohol consumption among male adults at a slum in Kolkata, India. *J Health Popul Nutr.* 2012;30:73-81.
- [4] John A, Barman A, Bal D, Chandu G, Samuel J, Thokchom M et al. Hazardous alcohol use in rural southern India: nature, prevalence and risk factors. *Natl Med J India.* 2009;22:123-25.
- [5] Gaunekar G, Patel V, Rane A. The impact and patterns of hazardous drinking amongst male industrial workers in Goa, India. *Soc Psychiatry Psychiatr Epidemiol.* 2005;40:267-75.
- [6] Krishnan A, Shah B, Lal V, Shukla DK, Paul E, Kapoor SK. Prevalence of risk factors for non-communicable disease in a rural area of Faridabad district of Haryana. *Indian J Public Health.* 2008;52:117-24.
- [7] Mohan D, Chopra A, Sethi H. The co-occurrence of tobacco & alcohol in general population of metropolis Delhi. *Indian J Med Res.* 2002;116:150-54.
- [8] Nayak MB, Bond JC, Cherpitel C, Patel V, Greenfield TK. Detecting alcohol-related problems in developing countries: a comparison of 2 screening measures in India. *Alcohol Clin Exp Res.* 2009;33: 2057-66.
- [9] Pal HR, Jena R, Yadav D. Validation of the Alcohol Use Disorders Identification Test (AUDIT) in urban community outreach and de-addiction center samples in north India. *J Stud Alcohol.* 2004;65: 794-800.
- [10] Chagas Silva M, Gaunekar G, Patel V, Kukalekar DS, Fernandes J. The prevalence and correlates of hazardous drinking in industrial workers: a study from Goa, India. *Alcohol Alcohol.* 2003;38:79-83.
- [11] Pal HR, Yadav S, Joy PS, Mehta S, Ray R. Treatment nonseeking in alcohol users: a community-based study from North India. *J Stud Alcohol.* 2003;64:631-33.
- [12] D'Costa G, Nazareth I, Naik D, Vaidya R, Levy G, Patel V, et al. Harmful alcohol use in Goa, India, and its associations with violence: a study in primary care. *Alcohol Alcohol.* 2007;42:131-37.
- [13] Tomkins S, Saburova L, Kiryanov N, Andreev E, McKee M, Shkolnikov V et al. Prevalence and socio-economic distribution of hazardous patterns of alcohol drinking: study of alcohol consumption in men aged 25-54 years in Izhevsk, Russia. *Addiction.* 2007;102:544-53.
- [14] Assanangkornchai S, Sam-Angsri N, Rerngpongpan S, Lertnakorn A. Patterns of alcohol consumption in the Thai population: results of the National Household Survey of 2007. *Alcohol Alcohol.* 2010;45: 278-85.
- [15] Halme JT, Seppä K, Alho H, Pirkola S, Poikolainen K, Lönnqvist J et al. Hazardous drinking: prevalence and associations in the Finnish general population. *Alcohol Clin Exp Res.* 2008;32:1615-22.
- [16] De Leon J, Rendon DM, Baca-Garcia E, Aizpuru F, Gonzalez-Pinto A, Anitua C et al. Association between smoking and alcohol use in the general population: stable and unstable odds ratios across two years in two different countries. *Alcohol Alcohol.* 2007;42:252-57.
- [17] Sebo P, Bouvier Gallacchi M, Goehring C, Künzi B, Bovier PA. Use of tobacco and alcohol by Swiss primary care physicians: a cross-sectional survey. *BMC Public Health.* 2007;7:5.

### PARTICULARS OF CONTRIBUTORS:

1. Assistant Professor, JIPMER, Puducherry, India.
2. Professor, JIPMER, Puducherry, India.
3. Senior Resident, JIPMER, Puducherry, India.
4. Junior Resident, JIPMER, Puducherry, India.
5. Junior Resident, JIPMER, Puducherry, India.
6. Junior Resident, JIPMER, Puducherry, India.

### NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Ganesh Kumar S.,  
Department of Preventive and Social Medicine, JIPMER, Puducherry-605006, India.  
Phone: 9487896551, E-mail: sssgan@yahoo.com

FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: Dec 27, 2012  
Date of Peer Review: Mar 18, 2013  
Date of Acceptance: May 31, 2013  
Date of Publishing: Aug 01, 2013