

**Original Article**

# AN EPIDEMIOLOGICAL STUDY ON ASSOCIATION BETWEEN ALCOHOL AND TOBACCO USE IN AN URBAN SLUM OF MEERUT

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## ABSTRACT

**Introduction:** Alcohol consumption and problems related to alcohol vary widely around the world, but the burden of disease and death remains significant in most countries. Though there are studies indicating co-occurrence of alcohol use with tobacco, not much work is done on association of alcohol and tobacco use in India.

**Methods:** A cross-sectional study was conducted in the catchment area of UHTC (Urban Health and training Centre) among 324 males aged  $\geq 15$  years. Data was collected by home visit using WHO questionnaire (AUDIT: Alcohol use disorder identification test) Modified Kuppusswamy scale was used to assess the socio-economic status of the families. Also, data was collected to know the association of alcohol use with tobacco. Data was analyzed by chisquare test using SPSS 20.0 version.

**Results:** Among current drinkers, 56.2% used smoked tobacco while 11.8% of the teetotalers were smokers. Similarly, smokeless tobacco was used by 48.9% of current drinkers and 2.6% of the teetotalers. A highly statistically significant association was found between tobacco use and alcohol use (p value<0.001).

**Conclusions:** It can be very well concluded that alcohol users are more indulged into tobacco use as compared to teetotalers. Therefore, high risk screening for tobacco use among the alcoholics can be a vital step in the prevention of addiction, which is emerging as one of the major risk factor for non-communicable diseases.

**Key words:** AUDIT, tobacco use, smokeless tobacco, WHO

## INTRODUCTION

Alcohol has been consumed in India at least since the Vedic period of 2000–800 BC<sup>1</sup>. It was allowed in Hinduism, particularly among the ruling classes. However, Buddhism, Jainism, and Islam did not allow their followers to drink. Although alcohol became more freely available in the Indian subcontinent under British rule,

Indians did not generally incorporate drinking alcohol into their social or religious activities<sup>2</sup>. When India became independent in 1947, Mahatma Gandhi and the Indian National Congress Party campaigned against liquor production and sales on the grounds that it was injurious to health.<sup>1</sup>

Alcohol consumption and problems related to alcohol vary widely around the world, but the burden of disease and death remains significant in most countries. Approximately 4.5% of the global burden of disease and injury is attributable to alcohol. Alcohol consumption is the world's third largest risk factor for disease and disability; in middle-income countries, it is the greatest risk. Alcohol is a causal factor in 60 types of diseases and injuries and a component cause in 200 others. Almost 4% of all deaths worldwide are attributed to alcohol, greater than deaths caused by HIV/AIDS, violence or tuberculosis. Alcohol consumption is estimated to cause from 20% to 50% of cirrhosis of the liver, epilepsy, poisonings, road traffic accidents, violence and several types of cancer. Alcohol is also associated with many serious social issues, including violence, child neglect and abuse, and absenteeism in the workplace.<sup>3</sup> Alcohol is attributed to nearly 3.2% of all deaths and results in a loss of 4% of total DALYs (58 million).<sup>4</sup>

The economic cost involved in this affair is massive. To these relatively tangible costs, must be added, the heavy toll of unhappiness represented by broken marriages, ruined careers and neglected children. Increased percentages of young people have indulged in drinking alcohol in increased frequency and quantity thus constitutes serious hazards to health, welfare and life.<sup>5</sup>

The rationale of this study is that though there are studies indicating co-occurrence of alcohol use with tobacco, there is no such study in this part of the region. Thus, it reinforces on the findings of the very few studies and that too in different part of the country showing the existence of association between alcohol and tobacco use.

## MATERIAL & METHOD

The indexed study was conducted in Meerut which is an ancient city located 70 km (43 miles) northeast of the national capital New Delhi and 453 km North West of the state capital, Lucknow. It is a part of the National Capital Region of India.

Community based cross-sectional study was conducted in an Urban Slum, Multan Nagar in the field practice area of the department of Community Medicine, SMC (Subharti Medical College), Meerut among males aged  $\geq 15$  years during September 2010 to October 2011.

**Inclusion criteria:** Males aged  $\geq 15$  years, which had completed 15 years of age at the time of data collection, residing in the study area have been included in the sampling universe.

**Exclusion criteria:** Males staying in the study area of Meerut for less than 6 months and all the mentally challenged males were excluded from the study.

**Sample size:** Sample size for the proposed study was calculated according to National Family Health Survey-3<sup>6</sup> where prevalence of alcohol use in U.P. was given as 25.3% in males, therefore the adequate sample size calculated was approximately 324 assuming 10% non-response and considering 5% absolute error.

**Sampling technique:** Simple Random Sampling Technique

**Methodology:** The proposed study was conducted in the Urban slum of Multan Nagar in the field practice area of the Department of Community Medicine, SMC, Meerut after taking clearance from ethical committee. Sampling universe was 2112 registered families in the study area and the sampling unit was a family in this study. All male members aged  $\geq 15$  years were taken from each household, where on an average there were 2 males aged  $\geq 15$  years based on the demographic profile of the area, therefore  $324/2=162$  households were taken in order to cover the required sample size.

Individual unit (family) constituting the sample was randomly selected by Random number table method. All the male members aged  $\geq 15$  years were taken from each family after taking their written consent. If male aged  $\geq 15$  years were not found in a family then the next family was visited. If the selected subject was not found at the first interview, date and time was taken from their family members for revisit.

The purpose of screening was clearly stated in terms of its relevance to the individual's health status assuring the maintenance of confidentiality.

**Research tool:** Data was collected by home visit using WHO questionnaire (AUDIT: Alcohol Use Disorder Identification Test) as study tool by interviewing each study subject<sup>7</sup>. Additional information was obtained on the socio-demographic determinants of alcohol use. The AUDIT is a 10-question alcohol screening instrument developed by W.H.O. and validated in six-country sample from four industrialized

and two developing countries. Questions included in the instrument showed reliability across a wide range of cultural settings. The AUDIT has been shown to be highly sensitive (80%) and specific (89%) screening instrument<sup>8</sup>.

**Flemming (1996)** allows the classification of problem drinkers into more specific subgroups as hazardous, dependent and harmful drinkers<sup>24</sup>.

Questions 1-3 assess the quantity and frequency of drinking and are used to detect 'at risk' alcohol consumption. A combined AUDIT score  $\geq 4$  classifies drinking as hazardous.

Questions 4-6 screen for signs and symptoms of alcohol dependence.

A combined AUDIT score  $\geq 4$  indicates the emergence of alcohol dependence.

Questions 7-10 enquire about the problems caused by alcohol consumption and adverse consequences of drinking. A combined AUDIT score  $\geq 4$  indicates the existence of harmful drinking.

Modified Kuppuswamy scale was used to assess the socio-economic status of the families.

Data was analysed by using chi square test by SPSS 20.0 version and the results were expressed in proportions. If the cell frequency was less than 5, the result was obtained by Fischer's Exact test. All the alcohol users were motivated to visit the Mental Health Clinic at Urban Health & Training Centre, Multan Nagar being run with the help of the department of Psychiatry, Subharti Medical College, Meerut.

## RESULTS

Majority of the study subjects were seen in 15-24 years of age group (34.9%) with least (10.5%) being above 55 years. There is a decreasing trend observed in the age wise distribution of the study population. Mean age was  $36.85 \pm 14.53$  years.

As far as the marital status is concerned, 68.2% study subjects were married while 31.8% were unmarried; all the study subjects were Hindu by religion; majority (48.1%) belonged to the O.B.C. category while only 22.5% belonged to the S.C./S.T. category. Almost half (51.9%) were having nuclear type of family while 48.1% were having joint family. Majority of the study subjects (61.4%) had family size of 5-9 persons while only 12% were having the family size of 10 and above.

**Table 1: Distribution of the socio-demographic characteristics of the study population**

Socio-demographic Characteristics	Study Population (n=324) (%)
<b>Age (Years)</b>	
15-24	113 (34.9)
25-34	77 (23.8)
35-44	62 (19.1)
45-54	38 (11.7)
$\geq 55$	34 (10.5)
<b>Educational Status</b>	
Professional or Honours	7 (2.2)
Graduate or post Graduate	51 (15.7)
Intermediate or post high school diploma	63 (19.4)
High school certificate	85 (26.2)
Middle school certificate	64 (19.8)
Primary school certificate	24 (7.4)
Illiterate	30 (9.3)
<b>Occupation</b>	
Profession	4 (1.2)
Semi-Profession	2 (0.6)
Clerical/shop-owner/farmer	75 (23.1)
Skilled worker	48 (14.8)
Semi-skilled	52 (16.0)
Unskilled	53 (16.4)
Unemployed	90 (27.7)
<b>Income(Rs.)</b>	
0-9999	260 (80.2)
10000-19999	51 (15.7)
20000-29999	7 (2.2)
$\geq 30000$	6 (1.9)
<b>Marital status</b>	
Unmarried	103 (31.8)
Married	221 (68.2)
Religion - Hindu	324 (100)
<b>Caste</b>	
OBC (Other Backward Class)	156 (48.1)
S.C./S.T.(Scheduled Caste/Scheduled Tribes)	73 (22.5)
Others	95 (29.3)
<b>Family Type</b>	
Nuclear	168 (51.9)
Joint	156 (48.1)
<b>Family Size</b>	
1-4	86 (26.5)
5-9	199 (61.4)
$\geq 10$	39 (12.0)

Education wise, 26.2% were educated up to high school followed by intermediate (19.4%) and middle school (19.8%) and 9.3% being illiterate. As far as the occupational classification is concerned, around one fourth (23.1%) of the study subjects belonged to the category of clerical/shop-owner/farmer while only (0.6%) were semi-professional and more than a quarter (27.7%) being unemployed. Skilled workers were 14.8%, 16% being semi-skilled with unskilled being 16.4%. Majority of the subjects

(80.2%) had income in the range of Rs. (0-9999), out of which 78.8% had income below Rs.5000 and those with income above Rs.5000 were only 21.2% while 19.8% had income above Rs.10000.

**Table 2: Distribution of the Socio-economic status (Kuppuswamy scale) of the study population**

Socio-demographic Characteristics	Participants (n=324) (%)
<b>Educational Status (Head of the Family)</b>	
Professional or Honours	9 (2.8)
Graduate or post Graduate	54 (16.7)
Intermediate or post high school diploma	42 (13.0)
High school certificate	87 (26.9)
Middle school certificate	49 (15.1)
Primary school certificate	23 (7.1)
Illiterate	60 (18.5)
<b>Occupation (Head of the Family)</b>	
Profession	9 (2.8)
Semi-Profession	1 (0.3)
Clerical/shop-owner/farmer	84 (25.9)
Skilled worker	62 (19.1)
Semi-skilled	61 (18.8)
Unskilled	71 (21.9)
Unemployed	36 (11.1)
<b>Income(Rs.) (Head of the Family)</b>	
<1290	2 (0.6)
1291-3866	49 (15.1)
3867-6445	63 (19.4)
6446-9644	43 (13.3)
9645-12891	73 (22.5)
12892-25784	64 (19.8)
>25785	30 (9.3)
<b>Socio-economic status</b>	
Lower	5 (1.5)
Upper Lower	124 (38.3)
Lower Middle	97 (29.9)
Upper Middle	94 (29.0)
Upper	4 (1.2)

According to the Kuppuswamy classification, about two fifth (38.3%) of the study subjects belonged to the upper lower class (II) with least being 1.2% in the upper class (V). Also, 1.5% of the subjects belonged to the lower class, 29.9% to the lower middle class and 29% being in the upper middle class.

As is evident in table-3(i), among current drinkers, 56.2% used smoked tobacco while 11.8% of the teetotallers were smokers. Similarly, smokeless tobacco was used by 48.9% of current drinkers and 2.6% of the teetotallers. At the same time, 85.6% of the teetotalers were not addicted while 15.6% of the current drinkers were not addicted to alcohol use. A highly statistically

significant association was found between tobacco use and alcohol use (p-value<0.001).

**Table 3(i): Association of tobacco use with alcohol use**

Type of addictions	Teetotallers (Audit score=0) n=228 (%)	Current Drinkers (Audit score >0) n=96 (%)
Smoked tobacco	27 (11.8)	54 (56.2)
Smokeless tobacco	6 (2.6)	47 (48.9)
No addiction	195 (85.6)	15 (15.6)

$\chi^2 = 131.47$ , df = 2, p-value = 0.0001

**Table 3(ii): Association of tobacco use with alcohol use**

Type of addictions	Teetotallers (Audit score=0)	Current Drinkers (Audit score >0)
Tobacco users	33	101*
No addiction	195	15

$\chi^2 = 167.35$ , df = 2, p-value = 0.0001, OR = 0.03 (<0.05)  
\*Includes both smokeless and smoked tobacco users

**Table 4: Distribution of tobacco use in the study population**

Type of addiction	Respondents (n=324) (%)
<b>Smoked tobacco</b>	
Bidi	71 (21.9)
<b>Smokeless tobacco</b>	
Gutka	25 (7.7)
Pan masala	2 (0.6)
Tobacco	16 (4.9)
Smoker and smokeless tobacco user	10 (3.08)
None	210 (64.8)

On comparing tobacco users with no addiction, there was statistically significant association between tobacco users and those which had no addiction with chi square value being 167.35, p-value = 0.0001 and df = 2. The Odds ratio is being 0.03 (<0.05) at 95% CI [Table-3(ii)].

21.9% of the study population was bidi smokers while 13.2% used smokeless tobacco with majority being gutka users (7.7%) and least using pan masala (0.6%). Only 3.08% were indulged into both forms of addiction (Table-4).

## DISCUSSION

In the present study, 324 subjects were analysed to assess the prevalence of alcohol use and its association with smoking habit.

**Bobak M. et al (1999)**<sup>9</sup> in their study in Russia reported that among men smokers consumed more alcohol; women non smoking consumed less alcohol.

**Meena et al (2002)**<sup>10</sup> in their study in Rohtak city reported that 16.81% were current smokers among alcohol users which were 56.25% in the indexed study. 6.89% had the habit of taking pan-masala which were just 0.65 in the present study. 57.69% took 1-4 cigarettes/day, 35.89% took 5-8 cigarettes /day while 6.42 took 9-15 cigarettes/day.

**Dhupdale N. et al (2006)**<sup>11</sup> in their study in rural Goa stated that the alcoholics were 1.9 times more likely to consume tobacco than non-consumers (O.R.-1.9).

**Sampath S.K. et al (2007)**<sup>12</sup> in their study in Kolar in Southern India declared that smokers were more likely to drink than non-smokers and they were more problem drinkers than dependent drinkers.

**Gupta P.C. et al (2005)**<sup>13</sup> in their study reported that among alcohol users, 51.1% smoked tobacco and 35.6% used smokeless tobacco which is different in our study showing 21.9% of smokers while 13.2% were using smokeless form of tobacco.

**Mohan D. et al (2002)**<sup>14</sup> in their study reported that the prevalence of the use of "only tobacco use; only alcohol use" and concurrent smoking and drinking was 18.1%, 3.3% and 9.6% respectively. Alternatively, 56.2% of the current drinkers were tobacco users and 11.8% of the teetotalers were smokers.

## CONCLUSIONS

This study is an important step towards the public health problem of alcohol use and its co-occurrence with tobacco use. Most important conclusion is the reinforcement of the association between the two addictions of alcohol and tobacco use which indicates the need of stringent measures towards imparting health education among the alcoholics on tobacco use as well.

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