

# Alcohol Consumption by workers in automobile repair shops of a slum of Kolkata: An assessment with AUDIT instrument

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## Original Article

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## Abstract

### Background

National Household Survey of Drug Use in the India in its systematic effort to document the nationwide prevalence of drug use including alcohol consumption reported that almost 21% of the adult male Indian consume alcohol in a year. To find out prevalence, pattern and consequences of drinking and determine the relationship of alcohol use with demographic and socio-economic factors among automobile repair workers.

### Materials and Methods

A cross-sectional study was conducted among auto-mobile repair workers in the urban field practice area of All India Institute of Hygiene and Public Health, Kolkata.

### Results

Prevalence of alcoholism in the community of automobile repair workers was found to be as high as 79%. More than 50% of the alcoholics belonged to the hazardous and dependent variety according to the WHO developed AUDIT instrument. 53.01% of the alcoholics consumed foreign liquor predominantly and 87.95% bought them from licensed liquor shops. Mean age of initiation of drinking was 18.67 years. Taking loan OR (95% CI) 3.51(1.56-7.92), gambling OR (95% CI) 3.38(1.48-7.69) and clinical signs of alcoholism OR (95% CI) 5.52 (2.13 - 14.29) were significantly associated with chronic alcohol abuse. A multivariate logistic regression model was created for socio-economic variables which showed education AOR (95%CI) 4.65(1.34-16.31) and total number of family members AOR (95%CI) 5.33(1.31-25.02) were significantly associated with drinking status (Nagelkerke R<sup>2</sup> for this model is 0.2585).

### Conclusion

The prevalence of alcoholism is high in the automobile repair workers and therefore all efforts must be made to reduce, if not eliminate, alcohol consumption among the workers of auto-mobile service centres.

**Keywords:** AUDIT; consumption of alcohol; determinants of alcohol use; automobile repair workers

## Introduction

National Household Survey of Drug Use in the India in its systematic effort to document the nationwide prevalence of drug use including alcohol consumption reported that almost 21% of the adult male Indian consume alcohol in a year<sup>1</sup>. However, there is wide variation in the estimated proportions of persons consuming alcohol in the different states of India, ranging from a lowly 7% in the western state of Gujarat (officially under Prohibition) to as high as 75% in the North-eastern state of Arunachal Pradesh. Significantly higher use has been recorded among tribal, rural and lower socio-economic urban sections<sup>2-4</sup>.

Alcohol (sura) consumption was prevalent in India since time immemorial and its intoxicating effects are also well known since ancient times<sup>5</sup>. Ethanol acts by binding GABA and glutamate receptors, thus influencing the action of these receptors to create a net depressive effect (by down-regulating glutamatergic activity and up-regulating GABA-ergic activity)<sup>6</sup>. Addiction to alcohol is detrimental to all irrespective of the occupation one pursues<sup>7,8</sup>. However, it is strongly felt that workers of automobile industry, especially the repair shops, must give their best and remain totally alert while repairing or servicing the auto-mobiles. A little deviation from accuracy while performing their job may lead to insurmountable catastrophe like an accident and therefore, in order to give their best performance these workers should stay away from alcohol both at home and at place of work. Therefore, a situation analysis with special emphasis on the magnitude, impact and determinants of alcohol consumption will help to put in accurate and appropriate baseline data for planning a program by policy makers to reduce or even do away with this vice practice among the automobile workers who carry out the onus task of repairing our vehicles and thus play a major role in prevention and control of road traffic accidents.

Articles were searched in the pubmed with the following keywords - "automobile", "AUDIT", "alcohol abuse OR misuse". It was found that though many studies have been done to assess the effect of alcohol on road traffic workers (e.g. drivers); no studies have been conducted to understand and assess the problem of alcoholism among workers who perform such a vital job as repairing and servicing automobiles.

With this background, a study was conducted among the auto-mobile repair workers in and around a slum of Kolkata with the following objectives:

### Primary Objective:

To find out the pattern of alcohol consumption among the automobile repair workers who were working in the automobile shops located near the railway siding area of Chetla, Kolkata, West Bengal.

### Secondary Objectives:

1. To elicit the impact of alcohol consumption like loan taking, gambling on the study population
2. To find out the association of drinking alcohol with some socio-economic variables.

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### Material and Methods

#### Study period and Type:

The study was a Cross-sectional, epidemiological study conducted for three months- from 1st March, 2012 to 20th May, 2012.

#### Study place and study population:

The urban field practice area of All India Institute of Hygiene and Public Health, Kolkata is at Chetla slum, Kolkata<sup>9</sup>. Comprehensive health care service is being provided to the population through Urban Health Centre, Chetla entirely under the purview of AIH&PH, Kolkata. This health centre was established on 30th December, 1955 at 19 B, Chetla Hat Road, Kolkata<sup>9</sup>. Over the last six decades this centre has developed its own distinct identity which is closely related to the needs and aspirations of the people of the area it serves. High quality field based teaching, training and research for health personnel of all categories is provided through UHC, Chetla<sup>9</sup>. The total service area is 3.6 square km and spread over three wards of Kolkata Corporation catering to around 2.1 lac population of the Chetla slum<sup>9</sup>. Beyond the OPD care provision, regular house-to-house visit in the slum area is also being provided by the AIH&PH through its field workers working in one of its nine departments. One such department is Occupational Health. This department provides preventive, promotive, curative and rehabilitative health care services to the different professional groups especially those belonging to the unorganized sector like papad makers, tailors, phuchka/golgappa sellers/makers, rickshaw pullers, drivers and of course the workers of automobile repair shops. There are about 70 such repair shops where approximately 205 workers are engaged to work.

The age range of these workers is from 12 years to 80 years. Most of them belong to the adjacent districts of Kolkata; eg, North 24 parganas, South 24 parganas, Hooghly, East Midnapore. Some of them also come from adjacent states of West Bengal like Bihar, Jharkhand, Odisha. They have come here for their livelihood but the earning does not help them to remain above poverty line. On the whole the condition of these workers are far from satisfactory as far as health, education, income, living conditions are concerned. The working condition was also quite inferior as far as sanitation, protective measures and other basic amenities are concerned. The duty hours are also much more than the norms suggested by the Government of India. They are not provided with any form of medical insurance and UHC, Chetla is the only centre which provided them with comprehensive health care.

The required number of individuals were chosen from these 205 workers following simple random sampling.

#### Sample size and sampling design:

Because of lack of similar study related to this particular topic, it was decided to conduct a pilot study on a sample of the study population. In the pilot study, prevalence of

alcoholism was found to be approximately 70%. Using this prevalence rate and with 10% relative error, 5% alpha error the sample size calculated was 92 (taking finite population correction into consideration). Allowing 10% non-responsiveness, it became 103. Rounding up, it was decided to consider 105 individuals for the study.

### Study instrument:

The data collection instrument used was an interview schedule which had 2 parts.

1. The first part consisted of queries regarding the socio-economic profile of the study population (age in completed years), religion, caste, marital status of the participants (presently married, not married, widower), per capita income. Education was divided into illiterate (not able to read or write in any language above 7 years of age), below primary (not completed class IV), primary (completed class IV education), middle (completed class VIII education), Madhyamik (completed class X), higher secondary and above (completed at least class 12).
2. The second part dealt with behavioral and some other variables like age of initiation, visit of licensed /unlicensed shops to consume alcohol, any attempt to quit drinking, propensity to take loan, visit to commercial sex worker, gambling and clinical signs and symptoms of alcoholism
3. The third part consisted of validated and standardized questions from the AUDIT questionnaire. The AUDIT was developed by the World Health Organization (WHO) as a simple method of screening for excessive drinking and to assist in brief assessment of hazardous and harmful usage of alcohol and dependence symptoms. It also helps to identify alcohol dependence and some specific consequences of harmful drinking. It has high reliability in different tests ( $r=0.86$ )<sup>10</sup>. This instrument also deals with sensitive and issues related to drinking like feeling of guilt after drinking, age of initiation of drinking, duration of drinking, type of liquor consumed, drinking companion, most common source of alcohol, concern about drinking and most common reason for concern<sup>10</sup>. There are total 10 questions in the instrument. For each question, the participant has an option to score between zero to four; hence, the minimum attainable score was zero and the maximum attainable score was forty. A person was termed as a non-hazardous drinker if his/her score was less than or equal to seven; hazardous and harmful drinker if his/her score was eight and above. If a person scored 12 or above, (s)he is to be detected as alcohol dependent<sup>10</sup>.

### Ethics committee approval:

Ethical clearance were sought from the Institutional Ethics Committee of All India Institute of Hygiene and Public Health, Kolkata. Many of the workers were illiterate and even more were reluctant to put their signatures in any paper. Therefore, the researchers read out the consent form in the local bengali language and verbally sought their consent for participation in the study. This plan of obtaining verbal consent was permitted by the ethics committee.

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#### Data collection procedure:

Data was collected after obtaining informed consent from each of the selected participants. Participants selected were assured about confidentiality of the data. The researchers visited the concerned area three days in a week, viz. Monday, Wednesday and Friday. The visits were done between 12 noon to 2 pm at their place of work which was their lunch time or time of rest. After obtaining the socio-economic and behavioral data, participants were asked questions from AUDIT questionnaire. Finally, they were examined for clinical signs. For this study, 5 clinical signs were considered; viz, scleral jaundice, capillary engorgement, hand tremor, tongue tremor, hepatomegally. If a single clinical sign was found among the participants, they were marked as having "positive clinical signs".

#### Statistical analysis:

Statistical analysis was done using PSPP 0.7.9<sup>11</sup> and R 2.15.0<sup>12-15</sup>. Collected data was kept in a secure database. Missing information was infrequent. Proportion of the alcoholics was presented as percentage. Association of drinking status with loan, gambling, visiting commercial sexual workers etc. was evaluated with the help of odds ratio (95% confidence interval). Binary logistic regression with enter method was done with drinking status as dependent variable and demographic & socio-economic variables as the independent variables.

#### Result:

All the respondents were males. On analysis it was observed that the majority(43.80 %) of the respondents belonged to the age group 30-39 years. 11.43% of them were aged below 20 years. Again, majority (85.7%) of the workers were Hindus. Most of the workers (35.24%) belonged to General caste while 28.57% belonged to Schedule Caste. Most of them (37.14%) had completed primary education. It was also observed that 83.81% were married while 58.10% of them lived in nuclear families. Around 40.95% of the respondents had their family nearby and so, they could spend some time with their family members daily while the rest (59.05%) of the workers could visit their homes quite infrequently (once/twice in a fortnight to once a year). The mean age of initiation of drinking was 18.67 years.

**Table 1: Pattern of Alcohol Consumption**

Frequency distribution of drinkers (n=105) Number		
	Number	Percentage
Non-drinker*	22	20.95
Non-hazardous drinker (AUDIT score <=7)	39	37.14
Hazardous drinker (>= 8)	9	8.57
Dependent drinker (>=12)	35	33.33
Type of liquor intake (n=83)		
Predominantly country liquor	39	46.99
Predominantly foreign liquor	44	53.01
License status of the alcohol selling shops (n=83)		
Licensed	73	87.95
Non-Licensed	10	12.05

\* → did not consume any alcohol during last one year

Table 1 shows out of the 105 workers, 83 were consuming alcohol which made the prevalence of alcohol intake in the community as 79.05% out of which the proportion of nonhazardous drinkers with AUDIT score  $\leq 7$  was 37.14%, hazardous drinkers with AUDIT score of  $\geq 8$  was 8.57% and dependent drinkers with AUDIT score of  $\geq 12$  was 33.3% More than 50% of the users consumed foreign liquor. Even country liquor users preferred licensed shop; hence buyers from licensed shops were around 88% of the total alcohol consumers.

**Table 2 : Impact of Alcohol Consumption**

Drinking status	Loan **		CSW (n=103)		Gambling **		Other additions		Clinical signs **	
	Yes (%)	OR	Yes (%)	OR	Yes (%)	OR	Yes (%)	OR	Yes (%)	OR
Hazardous and dependent drinker	27 (61.4)	3.51 (1.56 - 7.92)	7 (15.9)	0.67 (0.24 - 1.85)	24 (54.5)	3.38 (1.48 - 7.69)	37 (84.1)	0.47 (0.14 - 1.60)	20 (45.5)	5.52 (2.13 - 14.29)
Others *	19 (31.1)	Ref	13 (22.0)	Ref	16 (26.2)	Ref	56 (91.8)	Ref	8 (13.1)	Ref
<b>Total (n=105)</b>	46 (43.8)		20 (19.4)		40 (38.1)		93 (88.6)		28 (26.7)	

→ this includes non-drinkers and non-hazardous drinkers ;

\*\* → Significant at .05 level

CSW: Commercial sex workers

Table 2 depicts, while calculating for the impact of alcohol consumption, bivariate analysis was done where the respondents were categorized in two groups – hazardous and dependent drinker vs. the rest (i.e., nondrinkers and non-hazardous drinkers) – the assumption being that chronic alcohol use would be necessary for effective impact. During the analysis, it was found that taking loan OR (95% CI) 3.51(1.56-7.92), gambling OR (95% CI) 3.38(1.48-7.69) and clinical signs of alcoholism (capillary engorgement, scleral jaundice, hand tremor, tongue tremor, hepatomegaly) OR (95% CI) 5.52 (2.13 - 14.29) were significantly associated with chronic alcohol abuse (hazardous and dependent drinkers).

Bivariate analysis was also done for different socio-economic variables with drinking status (ie, drinkers vs non-drinkers) and ultimately considered for multivariate model. Hosmer and Lemeshow goodness-of-fit for this multivariate model produced a p-value of 0.09 ( $p > 0.05$ ); indicating a good fit. This model showed that education AOR (95%CI) 4.65(1.34- 16.31) and total number of family members AOR (95%CI) 5.33(1.31-25.02) were significantly associated with drinking status (Nagelkerke R<sup>2</sup> for this model is 0.2585) when adjusted for caste, religion, type of family, marital status and living status[Table 3].

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**Table 3: Frequency, Bivariate and Multivariate Analysis of Drinkers vs Non-drinkers**

	Total	Drinker (%)	OR (CI)	AOR (CI)
<b>Caste</b>				
Others (including muslims)	62	41 (78.8)	0.909 (0.348, 2.373)	1.59 (0.44 , 6.44)
SC/ST/non-CREAMY OBC	51	41 (80.4)	Ref	Ref
<b>Education</b>				
Education below Middle/class VIII	82	70 (85.4)	4.487 (1.607, 12.53)	4.65* (1.34 , 16.31)
Persons who have completed At least class VIII	23	13 (56.5)	Ref	Ref
<b>Marital status</b>				
Presently MARRIED	88	69 (78.4)	Ref	Ref
Widowed/Divorced/Separated	17	14 (82.4)	1.29 (0.33, 4.95)	2.5 (0.43 , 20.0)
<b>Total number of family members</b>				
$\leq 4$	77	65 (84.4)	3.009 (1.12, 8.085)	5.33* (1.31 , 25.02)
$> 4$	28	18 (64.3)	Ref	Ref
<b>Religion</b>				
Hindu	90	74 (82.2)	3.083 (0.961, 9.893)	3.79 (0.79 , 19.01)
Muslim	15	9 (60.0)	Ref	Ref
<b>Type of family</b>				
Nuclear	61	50 (82.0)	1.515 (0.589, 3.895)	0.63 (0.15 , 2.34)
Joint	44	33 (75.0)	Ref	Ref
<b>Whether living with family daily or not</b>				
Yes	43	35 (81.4)	1.276 (0.483, 3.372)	1.4 (0.45 , 4.75)
No	62	48 (77.4)	Ref	Ref

\* → Significant at .05 level

\*\* → Multivariate model was also adjusted for age and income of the individual

Nagelkerke R<sup>2</sup> for the model → 0.2585

## Discussion:

### Prevalence of alcoholism

Prevalence of alcoholics in India was not constant and in West Bengal it is around 34% (NFHS-3)<sup>1</sup>. In a community based study in the same locality, 66% of the slum dwellers were found to consume alcohol<sup>16</sup>. In our study on automobile repair workers, almost four fifth (79.05%) of the sample population was found to be consuming alcohol. This difference in proportion might be because of the vulnerability of the automobile repair workers to alcoholism. Alcohol probably is a coping<sup>17</sup> mechanism for them from stress and strain of their long hours of hard labour. On the other hand, it could be an indicator of emerging depression<sup>18-20,7,8</sup> among this vulnerable population. Almost two fifth of the sample population were hazardous and dependent drinker. This was in contrast to 21% in a study done on some large scale industries of Goa<sup>21</sup> and around 15% among the Chetla slum dwellers<sup>16</sup>. It is clear that the prevalence of alcoholism in these automobile repair workers was undoubtedly high.

## Age, Religion and caste

According to NFHS-3 data<sup>1</sup>, maximum consumption of alcohol was among people aged 35-49 years (39.1%) which was 50.60% in our study. Compared to our study, where 82.22% of the Hindus consumed alcohol, the NFHS-3 data showed it to be 34.4%. Though on multivariate analysis, religion was not found to be a significant predictor which was inconsistent with other study<sup>22</sup>. The national data showed that 49.9% of Schedule Tribes were consuming alcohol while in our study the general caste people (86.49%) were the maximum drinkers. According to a NIMHANS-2003 study<sup>23</sup>, mean age of initiation for drinking was 19.45 years. Our study found it to be 18.67 years with 19 years as the median (Range=12-25 years). Therefore, there was not much difference in terms of mean age of initiation. In a study<sup>24</sup> done in Dublin, Ireland, it was reported that younger age was more likely to be dependent drinkers. However, the study population was HIV infected individuals which might be reason for the finding.

## Education

In this study it was observed that higher education played some role towards protecting the individuals from becoming alcoholics. This is consistent with other studies – both industrial<sup>21,25,26</sup> and community based<sup>22,27,24</sup>. Income

Monthly income of the participants was not significant in the multivariate analysis which was consistent with other studies<sup>22,26</sup>. Most probably, this was due to the homogeneity of the income of the participants [income (IQR) = ₹ 4500 (4000,5600)].

## Impact of Alcoholism

Consumption of alcohol coupled with low income and poor nutrition, puts a severe impact on the health of these vulnerable people. Beyond this there is an impact in their performance at their place of work leading to inadequate precision in repairing of the automobiles. The poor automobile repair workers with their meager earning and long working hours often drink to the extent that they have to take loan or gamble with the hope of earning more. At least one clinical sign (out of capillary engorgement, scleral jaundice, hand tremor, tongue tremor, hepatomegally) was present among 26.7% of the sample population. This was consistent with Ghosh et al findings<sup>16</sup>. Therefore to give these workers a better quality of life (both mental and physical), all steps must be taken immediately to eliminate alcoholism among them. Obviously, the workers fall in a vicious cycle of poverty, hard labour in an inconducive environment, alcoholism to relieve themselves from stress, more malnutrition, poor health and more poverty.

## Relevance of the study

Valuable baseline data on the health status of automobile repair workers under the care of AIH&PH were obtained;

Assessment of alcohol consumption with AUDIT instrument it underlines the vulnerability of the automobile repair workers to addiction and the necessity of well planned, feasible and effective interventions to reduce the prevalence of alcohol intake among them. This will in the long run play a very important role in contributing a high quality physical and mental health to this vulnerable population. A limitation of the study was that it was cross-sectional in nature and hence causal-association could not be established. The possibility of conscious falsification on the sensitive issues could not be ruled out, despite the sincere efforts by the researchers regarding confidentiality. The advantages of cross-sectional design were that the study was easy to conduct, relatively inexpensive, and easy to get cooperation from participants because data was collected only once.

## Conclusion:

The magnitude of alcoholism among the automobile repair workers of Kolkata is a matter of concern; there is necessity of including them in the ambit of preventive care and intervention. The finding of this study will hopefully assist in developing targeted programs and developing and monitoring intervention on alcoholism.

## Future scope of study:

Workplace studies are deficient on the automobile repair workers. Further studies could be done to assess the impact of demographic, socio-economic and environmental factors on the overall health of this vulnerable section of the society. Longitudinal studies to evaluate the effect of structured intervention methods to reduce alcoholism and to establish association of different socio-demographic variables with alcohol consumption will be a very useful exercise.

## List of Abbreviations:

AUDIT → Alcohol Use Disorder Identification Test  
 AIH&PH → All India Institute of Hygiene and Public Health  
 WHO → World Health Organization  
 UHC → Urban Health Centre, Chetla  
 OR → Odd's Ratio

## Conflict of Interest:

There are no conflicts of interest among authors arising from the study.

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## Authors' contributions:

AD : Conception and design of the study; drafting the article revising it critically for important intellectual content; and final approval of the version.

SR : Designed the study, acquired and analyzed the data, drafted the manuscript, and revised it.

RB, DR, JP, AG : Acquired the data, interpreted the data, and revised the manuscript.

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