Original Article

Prevalence and Risk Factors of Alcohol Consumption Behavior among Late Adolescents: Evidence from Puducherry, India

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Abstract

Introduction: Alcohol is a psychoactive substance with dependence-producing properties. Adolescents account for a quarter of current drinkers in the world. Early initiation of alcohol use is one of the most important predictors of future physical and social health. **Materials and Methods:** A cross-sectional descriptive study among a sample of 210 adolescent males (aged 18–19 years), was conducted to identify the prevalence of alcohol consumption and the factors associated with it. The data were statistically analyzed using frequencies, percentages, Chi-square tests of independence and binary logistic regression. **Results:** About 62.3% ($n = 131$) of the respondents have consumed alcohol and 54.3% ($n = 114$) were current drinkers. Alcohol consumption was significantly associated with monthly pocket money ($N = 210$, $\chi^2 = 17.834$, df = 5), parents-consuming alcohol ($N = 210$, $\chi^2 = 6.926$, df = 1), friends-consuming alcohol ($N = 210$, $\chi^2 = 24.549$, df = 1), smoking status ($N = 210$, $\chi^2 = 54.189$, df = 1), and awareness about health effects of alcohol ($N = 210$, $\chi^2 = 193.482$, df = 2). Social influences of "friends-consuming alcohol" and "parents-consuming alcohol" were strongly associated with alcohol consumption among adolescents with odds ratio (OR) of 4.048 (95% confidence interval [CI] = 1.485–11.032) and 2.172 (95% CI = 1.076–4.386), respectively. In addition, it was also observed that smoking status and high monthly pocket money of INR 8000–12000 was strongly associated with alcohol consumption status with OR of 15.161 (95% CI = 5.076–45.286) and 25.660 (95% CI = 1.323–498.489), respectively. **Conclusion:** The study highlights the possible role of the individual, economic and social dimensions in the initiation of alcohol consumption among adolescents. The alcohol prevention interventions should be delivered through a multi-pronged approach focusing on these dimensions to be more effective.

Keywords: Adolescent health, alcohol consumption, alcohol dependence, alcohol use

Background

Alcohol is a psychoactive substance with dependence producing properties and has been widely used in many cultures for centuries.[1] Alcohol-related morbidities and incidents account for a significant burden of disease. About 40.5 million individuals are moderately or severely disabled due to alcohol dependence and 19.9 million years are lost due to disability associated with alcohol use disorder.[2] Prevalence of alcohol consumption remains steady, hovering > 50% over the past decades. Harmful use of alcohol resulted in an estimated 3.1 million deaths (5.3% of all deaths) globally in 2016. It ranks among the top five risk factors for disease, disability and death worldwde.[1] As per the report on alcohol and health 2018, in south-east Asia region, the deaths resulting due to alcohol consumption are extremely high in comparison with deaths due to other causes such as HIV/AIDS (1.8%),[3] diabetes (2.8%),[4] hypertension (1.6%), digestive diseases (4.5%), injuries (2.5%), and violence (0.8%).[5]

Worldwide, it is estimated that about more than half (57%, or 3.1 billion people) of the global population aged 15 years and above had consumed alcohol in the past 12 months and 2.3 billion people are current drinkers.[1] A quarter of all current drinkers are 15–19 years old with the majority of them in the late adolescence (18–19 years old).[6] Factors such as lifestyle,

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high levels of stress and anxiety, low self-esteem, depressive symptoms, susceptibility to peer pressure and problems associated with school, are known to result in alcohol usage among adolescents.[7]

Alcoholism is a predominant problem in developing countries like India. The estimated alcohol users in the country stand at 62.5 million with 17.4% of them (10.6 million) being dependent users and 20%–30% are being admitted in hospital due to problems and disorders because of alcohol consumption.[8] Studies report that alcohol consumption among teenagers in Indian metro cities is increasing at a rapid pace with 45% of youth drinking excessively, often more than five or six times a month, with some individuals starting hazardous alcohol consumption earlier in childhood.[9] The prevalence of problematic alcohol use continues to escalate into the late adolescent of 18–20 years.[9] Studies report that initiation of alcoholism happens usually in the late adolescence and early adulthood further shaping the lifestyle and health risks of the individual over the period.[8] Moreover, alcoholism, heavy drinking and alcohol dependence may result in road traffic accidents, vandalism, homicide, unemployment, depression accounting for the social and economic burden on the society.

Given the significant social and economic burden it possesses, understanding the prevalence of alcoholism among late teens and the factors causing its initiation is essential. A better understanding of them can help in developing strategies for preventing the development of this risk factor. In this regard, the study aims at addressing the following objectives.

Objectives

1. To measure the prevalence of alcohol consumption among male adolescents in Puducherry, India
2. To identify the factors associated with the initiation of alcohol consumption among male adolescents in Puducherry, India.

Given the cultural sensitivity associated with the topic in the Indian context, and the need for informed consent, the study confined itself to males in their late adolescence (i.e., 18–19 years).

Materials and Methods

Study design

Considering aim and objectives of the study, the cross-sectional epidemiological study design was adopted. The design enabled identification of the prevalence of alcohol consumption among adolescents and the factors associated with its initiation.[10]

Study setting

A community-based survey was conducted in Puducherry union territory, India. Random sampling technique was used for the selection of Karikal district, which is one of the four regions of Union Territory of Puducherry. It is surrounded by the Nagappattinam and Thiruvarur Districts of Tamil Nadu state. Total population of the district is 2,00,222 with Male (97,809), Female (1,02,413). The sample is taken among the adolescent males in the age group of 18–19 years, in the taluks of Karaikal, Kottucherry, Neravy, Thirunallar, T.R. Pattinam, and Nedungadu.

Sampling

A sample size of 195 was computed at 97% confidence level using the formula $n = (\text{DEFF} \times \text{Np}\,[1 - p])/[d^2/Z^2_{1-\alpha/2} \times (N - 1) + p \times (1 - p)]$, considering the prevalence rate of 8.9 (as per NFHS-4 report for Puducherry). OpenEpi software (available at https://www.openepi.com/Menu/OE_Menu.htm) was used for sample size estimation. An additional 10% of nonresponse rate was considered rounding off the total sample size to 210. Multi-stage random sampling approach was used to capture the sample. Karikal district was the primary sampling unit, the taluks of Karaikal district are secondary sampling units, municipalities in the districts were tertiary sampling units and individual households were ultimate sampling units. Thirty-five households each were randomly identified during community survey from each of the six taluks to ensure equal geographical representation.

Data collection

A structured questionnaire was used for data collection in the study. The tool used was adapted from an earlier study in the Asian context.[10] Socio-demographic domains relevant to the study's context were added to the tool. The final questionnaire captured data on socio-demographic characteristics of the sample, their alcohol consumption behavior and awareness about the health effects of alcohol. The data was collected by the process of structured interview. The data were collected after obtaining the informed consent from participants.

Data analysis

The data analysis was performed using IBM SPSS version 20 (IBM Corp., Armonk, New York).[11] The variables were categorized according to the type of data. Descriptive statistics were done to identify the frequencies. Bivariate analysis using Chi-square was used to identify the associations between the variables. Multivariate analysis using binary logistic regression was conducted to assess the functional relationship between alcohol consumption and associated variables. Significance of the associations was assessed by computing *P* value and comparing it against the set alpha of 0.05.

Ethical considerations

Measures were taken to ensure the highest ethical standards at all stages of the study. The study was approved by the Institutional Human Ethics Committee (IHEC) of the Central University of Kerala with reference no CUK/IHEC/2018/037. The participants were provided all the information in Tamil (the local language of the study site). Informed consent was obtained in written from all the participants who were willing to participate in the study. Confidentiality of the participants and data security was ensured.

Results

Sociodemographic profile of the participants

A total of 210 participants were surveyed in the current study. All the participants were male. More than 59% (n = 125) of

the respondents were aged 18 years, 40.5% (n = 85) aged 19 years. Majority of the respondents were Hindu (79.5%) followed by Christian (11.9%) and Muslim (8.6%). 94.3% of the respondents reported living with their parents and majority of respondents (89%, n = 189) reported currently studying. 81% of the respondents were dependent on their parents for their expenses. 39.5% received monthly pocket money of Rs. 1000–Rs. 2000 and 1.9% are getting Rs. 8000–12000. The detailed overview of the socio-demographic prospects of the sample is provided in Table 1.

Alcohol consumption status

A total of 210 males aged 18–19 years were surveyed. Of the total sample, 62.4% (n = 131) reported consuming alcohol at any point of time with the mean age of initiation of alcohol consumption being 16.04 years. Among the sample, 54.3% (n = 114) were found to be current drinkers (i.e., had consumed a drink containing alcohol in the past 12 months).[12] Among those who drank in the past 12 months, 4.3% of adolescents consumed alcohol daily. Among those who were not daily consumers of alcohol, 6.2% reported consuming alcohol once a month, 10.5% consumed alcohol 1–3 times a month, and 22.4% reported to consume alcohol 1–3 times a year.

Table 1: Sociodemographic characteristics of the sample

Category (n=210)	Frequency, n (%)
Age of the respondent (years)	
18	125 (59.5)
19	85 (40.5)
Religion	
Hindu	167 (79.5)
Muslim	18 (8.6)
Christian	25 (11.9)
Type of family	
Nuclear	155 (73.8)
Joint	55 (26.2)
Living with	
Parents	198 (94.3)
Relatives	5 (2.4)
Friends	7 (3.3)
Currently studying	
Yes	187 (89)
No	23 (11)
Level of education	
Lower secondary (6–8 class)	6 (2.9)
Secondary (9 and 10)	43 (20.5)
Higher secondary (11 and 12)	49 (23.3)
Higher education (above 12 class)	112 (53.3)
Monthly pocket money (INR)	
100–500	15 (7.1)
500–1000	65 (31.0)
1000–2000	83 (39.5)
2000–4000	31 (14.8)
4000–8000	12 (5.7)
8000–12,000	4 (1.9)
Family history of alcohol use	
Yes	120 (57.1)
No	90 (42.9)
Friends history of alcohol use	
Yes	179 (85.2)
No	31 (14.8)

INR: Indian Rupees

Bivariate analysis

Bivariate analysis was conducted using Pearson Chi-square test to identify the factors associated with the initiation of alcohol consumption among the males aged 18–19 years. Cramer's V was computed to assess the strength of associations reported by Chi-square statistic. The factors were broadly divided into three categories, namely sociodemographic factors, social factors and personal attributes. The detailed outline of the bivariate results is presented in Table 2.

The personal attributes of the individual were the factors strongly associated whereas socio-demographic factors were comparatively weakly associated. Specifically, the personal attribute of awareness of the health effect of alcohol is strongly associated with the initiation of alcohol consumption ($\chi^2 = 193.48$, df = 2; Crammer's V = 0.96; $P \leq 0.01$). The current education of the respondent in other hand was poorly associated ($\chi^2 = 0.378$, df = 1; Crammer's V = 0.042; $P > 0.05$). It was also identified that social factors had a significant association with the initiation of alcohol consumption, with the variable "friends consuming alcohol" having a stronger association ($\chi^2 = 24.549$, df = 1; Crammer's V = 0.342; $P \leq 0.01$).

Multivariate analysis

Binary logistic regression was conducted to estimate the functional relationship between initiation of alcohol consumption and factors identified through bivariate analysis. Alcohol consumption status was the binary dependent variable, with positive response (i.e., yes) being the reference category and negative response (i.e., no) being the study category. The developed model was significant, with the independent variables accounting for a significant percent of the variance in the dependent variable (Nagelkerke $R^2 = 0.435$). The results of binary logistic regression are provided in Table 3.

Discussion

Our study found that the prevalence of alcohol consumption among adolescent males was 62.4% among the study sample. This high prevalence of alcohol consumption among males in the Indian context was not uncommon. Earlier studies reported the prevalence of alcohol consumption to be ranging from 46.7% to 72%.[13-15] In the context of rural south India, the prevalence was reported as high as 72/100 males (or) 72%.[14] The results of the current study fall in line with observations from earlier studies strengthening the arguments on the high prevalence of alcohol consumption among adolescent males. Moreover, a significant percentage (>50%) of the respondents were found to be current drinkers. While India has lesser percapita consumption of alcohol compared to several other nations,[16] the sheer size of the population, type of the alcohol consumed (mostly spirits), quantity consumed

Table 2: Table reporting the bivariate results of factors associated with initiation of alcohol consumption

Factor	Independent variable	χ^2	df	Crammer's V	*P*
Socioeconomic factors	Household income	10.301	5	0.221	0.067
	Monthly pocket money	17.834	5	0.291	0.03*
	Current education	0.378	1	0.042	0.539
Social factors	Parents consuming alcohol	6.926	1	0.182	0.01**
	Friends consuming alcohol	24.549	1	0.342	0.01**
Personal attributes	Awareness about health effect of alcohol	193.482	2	0.96	0.01**
	Smoking status	54.189	1	0.508	0.01**

**$P \leq 0.01$, *$P \leq 0.05$

Table 3: Table reporting functional relationship between alcohol consumption and its associated factors

Variable	*B*	SE	OR	95% CI for OR		*P*
				Lower	Upper	
Alcohol consumption (Dependent variable)						
Yes (*n*=131) (*Ref*)						
No (*n*=79)						
Constant	−3.070	0.757	0.046			0.000
Parents/guardian drinking alcohol						
Yes (*ref*)						
No	0.776	0.359	2.172	1.076	4.386	0.031*
Friends consuming alcohol						
Yes (*ref*)						
No	1.398	0.512	4.048	1.485	11.032	0.006**
Smoking status						
Yes (*ref*)						
No	2.719	0.558	15.161	5.076	45.286	0.000**
Monthly pocket money						
Rupees 100–500 (*ref*)						0.085
Rupees 500–1000	0.196	0.580	1.217	0.391	3.791	0.735
Rupees 1000–2000	−0.049	0.574	0.952	0.309	2.936	0.932
Rupees 2000–4000	−1.078	0.793	0.340	0.072	1.611	0.174
Rupees 4000–8000	−0.650	0.949	0.522	0.081	3.354	0.494
Rupees 8000–12,000	3.245	1.513	25.660	1.323	497.489	0.032*

*$P<0.05$, **$P<0.01$. OR: Odds ratio, CI: Confidence interval, SE: Standard error

and drinking habits pose serious health risks and burden to the health system.

The high prevalence of alcohol consumption among adolescents was observed with a mean age of initiation at 16.04 years. The age of initiation of alcohol is an important predictor for alcohol dependence in adulthood. Studies from developed countries report that early initiation of alcohol (i.e., age at first drink ≤13 years) significantly double the odds of alcohol dependence.[17] While the mean age of first drink in the current study's context is greater, there is still a need for targeted interventions for this age group to prevent the initiation of alcohol consumption.

In the study, it was observed that the monthly pocket money which the respondents received was significantly associated with alcohol consumption. Greater access to alcoholic beverages due to pocket money is possibly one of the factors involved in heavy alcohol use among adolescents. Evidence reports that higher monthly pocket money places greater purchasing capacity towards the adolescents, supporting the alcohol consumption behavior. A study conducted among Swedish higher secondary school children reported that high purchasing power increased the odds (2.1; 95% confidence interval = 1.4–3.0) of high alcohol consumption among boys.[18] Interestingly, in the current study, it was observed that the respondents who had high pocket money (i.e., INR 8000–12000) have a high significant odd of not consuming alcohol. However, it could be said that this observation might be of little importance since only a minimum ($n = 4$) number of respondents were in high pocket money range of INR 8000–12000.

Growing incomes and the practice of "monthly pocket money" could be an important determinant associated with alcohol consumption. Given that majority of the adolescents are

dependent on their parents/guardians for money, monitoring of expenditure could be one of the potential strategies to address it. One of the possible ways to address it is to use digital banking by the parents to give pocket money to their child. Usage of digital banking will enable transparency in transactions and facilitate monitoring of adolescent's alcohol-related expenditure.

It was observed that societal influences of parents consuming alcohol and friends consuming alcohol were significantly related to the initiation of alcohol consumption among adolescent males. Specifically, it was observed that the friend's consumption of alcohol had a stronger association with alcohol consumption. Study results show that individuals whose friends were not consuming alcohol had over four times odds of not consuming alcohol, compared to those who consumed. Earlier studies report that having friends who consume alcohol is one of the important factors associated with the initiation of alcohol consumption. A study conducted in Ludhiana among college-going students identified that around 3/4th of the male students had their first drink with friends and 38.8% reported having their first drink by the encouragement of their friends.[19] These observations show that the peer groups of friends and colleagues can have determinantal effects on development and continuance of risk factors like alcohol consumption. Peer groups (particularly friends) could serve as important mechanisms to prevent alcohol consumption. Specifically, anti-alcohol interventions among adolescents should consider institutional mechanisms (such as sports clubs, fan clubs, colleges, etc.,) to implement alcohol prevention strategies.

Moreover, it was also observed that there was a strong association between alcohol consumption among adolescents and their family history of alcohol consumption. Adolescents whose parents/guardians did not consume any alcoholic beverages had higher odds (odds ratio = 2.172, $P < 0.05$) of not consuming alcohol, compared to the adolescents whose parents/guardians consumed alcohol. Existing literature strengthen these arguments. Family history of alcohol abuse was known to have a significantly strong association with problematic drinking among college students (usually late adolescents).[20]

These observations draw focus toward the social dimensions which encourage initiation of alcohol consumption. Alcohol prevention interventions should focus on these dimensions to encourage cessation and prevention behaviour. Specifically, interventions should be tailormade to actively involve adolescents and their families in alcohol prevention dialogue. Emphasis on family and societal domains were found to be successful in other areas of drug/substance abuse. For example, anti-tobacco health spots educating the parents on second-hand effects of tobacco smoke on their children were effective in encouraging tobacco cessation behaviours. Similarly, anti-alcohol health messages may be developed and implemented to prevent alcohol consumption by adolescents.

The study found that the personal attributes of knowledge about the health effects of alcohol and smoking status are strongly associated with the initiation of alcohol consumption among adolescents. Tobacco and alcohol usage co-exist, and literature evidence reports a very strong association between tobacco consumption and alcohol use.[21,22] Similarly, literature evidence also reports on the relationship between awareness of the health effects of alcohol and alcohol use. Evidence indicates that an increase in the awareness of harmful health effects of alcohol reduces its consumption.[23,24] While these ideas form the basis for several of the health awareness campaigns on alcohol, it could be noted that alcohol is comparatively little focused than tobacco.[25] The perception that "smoking is dangerous, but alcohol is not" is persisting, which was observed by the researcher during the interaction with the sample. Awareness campaigns should focus on collectively addressing alcohol and tobacco. Mass-media campaigns and social media campaigns should be used to bring about awareness among the youth.

Limitations

The results of the study should be interpreted, considering its limitations. First, the current research sample were males in their late adolescence, i.e., 18–19 years. The findings of the study may not hold the same for other gender groups and age groups. Second, the study is cross-sectional in nature, while the functional relationship between the dependent and predictor variables is suggestive of the causal association, it doesn't confirm the same.

Conclusion

Harmful consumption of alcohol is an important public health challenge with long-term impact on individual's health and country's health system. Particularly, early age of initiation of alcohol consumption (i.e., during adolescence) is a growing public health concern as reported in the current study. Government of India is focussing on preventing NCD risk factors (including alcohol consumption) among adults through its NCD prevention and control programme. Adolescent health is focussed upon in a separate Rashtriya Kishore Swasthya Karyakram program. The results of the current study reflect the need for synergy between the two programs. Essential measures are to be taken to control the growing burden of alcoholism among adolescents. Specifically, given that peer groups (i.e., friends and family) have a determinantal effect on consumption of alcohol, alcohol prevention interventions should involve their participation. In addition, it should also be noted that alcohol cessation intervention among adults should also be targeted as the current study reports that consumption of alcohol by adults could positively impact the consumption of alcohol by their children.

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Conflicts of interest

There are no conflicts of interest.

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