Pattern of alcohol consumption and its associated morbidity among alcohol consumers in an urban area of Tamil Nadu

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ABSTRACT

Introduction: In India, though the prevalence of alcohol consumption is low, nearly half of the alcoholic consumers fall into the category of hazardous drinking. There have been rapid changes in the trends and pattern of alcohol use in India. **Aims:** The study was carried to find out the pattern of alcohol consumption, associated morbidities, and its association with related factors in an urban area of Tamil Nadu. **Materials and Methods:** This is a descriptive cross-sectional study done among adult males >18 years of age in Kancheepuram district Tamil Nadu. Among the 400 study participants selected by simple random sampling, 156 were found to be alcohol consumers. A pre-tested structured questionnaire and Alcohol Use Disorders Identification Test (AUDIT) was used to identify the pattern of alcohol consumption and the associated health morbidities. Data analysis was done using SPSS version 22. **Results:** It was found that 67% of alcohol consumers had a problematic drinking pattern with 52.5% having a hazardous/harmful drinking pattern and 14.7% were found to be dependent alcoholics. The associated factors of problem drinking among the alcohol consumers were illiteracy, having a history of tobacco use, being unmarried/divorced and consuming alcohol in wine shops. The health morbidities that were found to be associated with alcohol consumption were hypertension, gastritis/peptic ulcer disease, and psychiatric illnesses. **Conclusion:** More than half of the alcohol consumers had a problematic drinking pattern, which is an alarming public health problem. All the current drinkers in a community have to be screened for problematic drinking pattern and it has to be supplemented with referral services, health promotion, behavioral change communication to the alcohol consumer, and his family members.

Keywords: Alcohol dependence, alcohol use disorders, depression, hypertension

Introduction

The term alcohol refers to "ethyl alcohol." It is consumed as an alcoholic beverage in diluted concentrations of absolute (i.e. 100%) ethyl alcohol. One standard alcoholic beverage corresponds to 10 grams of absolute alcohol. The quantity differs among the types of alcoholic beverages. The most commonly used alcoholic beverages in India are beer, wine, whiskey, rum, vodka, gin, and brandy and locally brewed beverages like arrack and toddy.[1]

Alcohol use disorder (AUD) is a pattern of alcohol use that involves problems controlling your drinking, being preoccupied with alcohol, continuing to use alcohol even when it causes problems, having to drink more to get the same effect, or having withdrawal symptoms when you rapidly decrease or stop drinking.[2] The prevalence of AUDs is highest in Europe (7.5%) and the lowest among East Mediterranean Regions which

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includes Afghanistan, Bahrain, and Egypt. Globally, 50% of deaths because of liver cirrhosis, 30% of deaths because of oral and pharyngeal cancers, 22% of deaths because of interpersonal violence, 22% of deaths because of self-harm, 15% of deaths because of traffic injuries, 12% of deaths because of tuberculosis, and 12% of deaths because of liver cancer were attributed to alcohol consumption.[3]

In India, according to Sample Registration Survey 2014, the prevalence of alcohol consumption among adult males was found to be 10%.[4] The prevalence of AUDs in India in the year 2010 was found to be 4.5% and that of alcohol dependence was found to be 3.8%.[5] The National Mental Health Survey of India 2015–2016 found the prevalence of AUDs to be 9% in adult men. In India, in the year 2016, alcohol attributable fraction of all-cause deaths was found to be 5.4% and 62.9% of all the deaths because of liver cirrhosis, and 33.1% because of road traffic accidents were attributable to alcohol use.[6]

According to WHO, *Hazardous drinking* is defined as "a quantity or pattern of alcohol consumption that places individuals at risk for adverse health events" *Harmful drinking* is defined as "alcohol consumption that results in physical or psychological harm." *Alcohol dependence* is defined as "a cluster of behavioral, cognitive, and physiological phenomena that develop after repeated alcohol use."[7]

The victims of alcohol abuse can develop health problems like hypertension, increases the risk for oral/esophageal cancers, gastritis, anemia, erectile dysfunction, alcoholic myopathy, dementia, depressive symptoms like lack of interest, sadness, and feeling low during intoxication and withdrawal from alcohol. Suicide rates are higher among persons who abuse alcohol when compared with the general population. Around 3% of those falling to victims of heavy alcohol drinking can develop psychotic symptoms. The symptoms may include hallucinations and delusions which could result in certain behavioral problems.[1,8] Based on the above background, the study was carried out in an urban area of Kancheepuram district in Tamil Nadu with the following objectives:
1. To find out the pattern of alcohol consumption and its association with related factors among alcohol consumers in the study area
2. To find out if there is an association between alcohol consumption and the various health morbidities present in the study participants.

Methodology

This study is a part of a larger study titled "Epidemiology of alcohol consumption in an urban area of Kancheepuram district, Tamil Nadu."[9]

Study design

This is a community-based descriptive cross-sectional study.

Study area and population

The study was carried out in the urban field practice area of a medical college in Anakaputhur, an urban area in Kancheepuram district of Tamil Nadu. It consists of 18 wards with a population of 48050 (males: 24,158; females: 23,892).[10] The study participants were adult males >18 years of age permanently residing in the study area.

Sample size and sampling method

The required sample size was calculated using the formula $N = Za^2pq/[L]^2$ where P was 42.65% (based on the previous study done by Lakshmi *et al.* in Chennai)[11] with an allowable error of 12% of prevalence at 95% CI and 10% for nonresponse. The required sample size for the study was found to be 388 which were rounded off to 400.

From among the 18 wards in Anakaputhur, 4 wards were chosen randomly by lottery method (ward 3, 8, 11, and 17). The list of adult males >18 years of age with their names and addresses residing in the respective wards was obtained from the electoral roll.[12] After numbering adult males in each ward, 100 of them were chosen from each ward by simple random sampling technique using the Research Randomizer Website to arrive at the required sample size.[13] From among the study participants, the total number of participants who consume alcoholic beverages was found to be 156 (39%).[9]

Study period

The study was carried out between the period of July 2017 and December 2017.

Study tool and data collection method

A pretested semi-structured questionnaire was used for data collection among the study participants. The questionnaire included details regarding the sociodemographic characteristics of the study participants, current drinking pattern of the participants who consume alcoholic beverages, awareness of health problems caused because of alcohol consumption, and the presence of health morbidities.

The participants who consumed alcohol in the past 12 months were considered as current drinkers and were administered the Alcohol Use Disorders Identification Test (AUDIT) questionnaire. It is a 10-item questionnaire, developed by the WHO and used as a screening tool to assess alcohol consumption, alcohol-related problems, and their drinking behaviors.[14-16] The participants were enquired about their drinking behaviors and consequences over the past 12 months and their responses were recorded and scored from 0 (never occurs) to 4 (daily). The scores from the 10-item AUDIT questionnaire are summed up. A cut-off score of ≥8 provides guidance whether he has a problematic drinking behavior or not. Those with the problematic drinking pattern are further classified into hazardous drinkers (score 8–15), harmful drinkers (score 16–20), and possible dependant alcoholics (score >20) using cut-off values as defined by WHO.[14]

Statistical analysis

The data entry was done and analyzed using SPSS version 22 (SPSS Inc. Chicago, ILL, USA) and presented using descriptive and analytical statistical methods.

Ethical approval and informed consent

The Institutional Ethical Committee approved the study protocol. Informed consent was obtained from all the study participants before administering the questionnaire.

Results

This study conducted among 400 adults in the study area shows interesting and valid results, which are presented using appropriate tables and graphs. The prevalence of alcohol consumption among the study participants was found to be 39%.[9]

Among the current drinkers, 67.3% of them are associated with problematic drinking. Among all consumers, 52.5% were hazardous/harmful drinkers and 14.7% of them were possible dependent alcoholics. For the purpose of intervention, the AUDIT questionnaire classifies the current drinkers into four zones based on the AUDIT score [Table 1].

Figure 1 shows the type of alcoholic beverage consumed by the current drinkers. Nearly 58.3% consumed brandy, 37.2% of them consumed whiskey, 29.5% consumed beer, 12.2% consumed wine, and 2.6% consumed vodka [Figure 1].

The current drinkers were enquired whether alcohol consumption carries any benefits for their health and well-being. Surprisingly, 28.8% of the current drinkers were of the belief that alcohol consumption can relieve body pain and stress and 25% believed that alcohol consumption helps in better socialization among friends [Figure 2].

Among the current drinkers, most of the problem drinkers (75.2%) were within the age group of 45 years and the majority of them were employed (76.2%). The major determinants for problem drinking among the current drinkers which were found to

be statistically significant ($P < 0.05$) were literacy (OR: 3.29 CI: 1.07–10.10), upper/upper middle socio-economic class (OR: 2.0 CI: 1.0 – 3.96), being unmarried or widowed/divorced (OR: 3.44 CI: 1.47–8.06), and history of tobacco consumption in any form (OR: 2.11 CI: 1.01–4.40) [Table 2].

It was observed that 73.5% of those who consume alcoholic beverages in wine shop/bar/street were found to be problem drinkers when compared with those who consume alcohol at home/friend's home (55.6%). This association was found to be statistically significant ($P < 0.05$) with an odds ratio of 2.22 (95% CI: 1.11–4.44). There was no statistically significant association found between problem drinking and the rest of drinking habits related to alcohol consumption [Table 3].

It was observed that 74.2% of the current drinkers who had their personal life getting affected because of alcohol consumption were found to be problem drinkers. This association was found to be statistically significant ($P < 0.05$) with an odds ratio of 2.15 (95% CI: 1.09–4.26). There was no statistically significant association between problem drinking and the rest of the social factors related to alcohol consumption [Table 4].

Among the study participants, it was found that current drinkers had an increased odds of having hypertension (OR: 1.86, CI: 1.11–3.09) and gastrointestinal diseases like gastritis and peptic

Table 1: Pattern of alcohol consumption and its risk levels among current drinkers using the AUDIT questionnaire

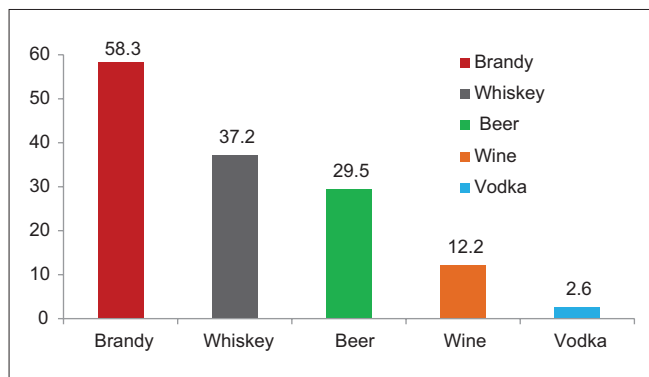| Characteristic	Frequency (*n*=156)	Percentage
Problem drinking (AUDIT score >8)		
Yes	105	67.3
No	51	32.7
Drinking behavior (AUDIT)		
Hazardous/harmful drinking (Score 8-20)	82	52.5
Possible dependent drinking (Score >20)	23	14.7
Risk level scoring for intervention (AUDIT)		
Zone 1 (Score 0-7)	51	32.7
Zone 2 (Score 8-15)	39	25.0
Zone 3 (Score 16-20)	43	27.6
Zone 4 (Score >20)	23	14.7

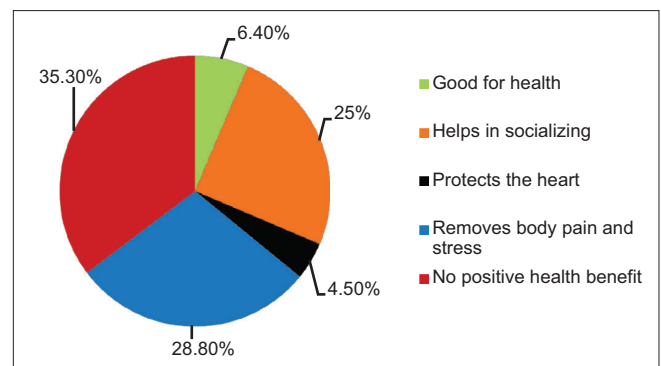**Figure 1:** Type of alcoholic beverage consumed by the study participants

Figure 2: Benefits of alcohol consumption as told by the current drinkers

Characteristics	Current drinkers (*n*=156)		Problem drinkers (*n*=105)		Chi-square	*P*	OR	95% CI
	n	%	*n*	%				
Age group								
<45 years	116	74.4	79	68.1	0.130	0.718	1.15	0.53-2.45
>45 years	40	25.6	26	65.0				
Education								
Illiterate	27	17.3	23	85.2	4.742	0.029*	3.29	1.07-10.10
Literate	129	82.7	82	63.6				
Occupation								
Unemployed/unskilled workers	44	28.2	25	56.8	3.064	0.080	0.526	0.25-1.08
Employed/Semiskilled/Skilled/professionals	112	71.8	80	71.4				
Socioeconomic status (BG Prasad Classification)								
Upper class/upper middle class	76	48.7	57	75.0	3.985	0.045*	2.00	1.00-3.96
Middle class/lower middle class/lower class	80	51.3	48	60.0				
Shift of work								
Night shift/alternating/unemployed	54	34.6	32	59.2	2.431	0.119	0.57	0.28-1.15
Day shift	102	65.4	73	71.6				
Marital status								
Unmarried/widower Divorced/separated	49	31.4	41	83.7	8.696	0.003*	3.44	1.47-8.06
Married	107	68.6	64	59.8				
Type of family								
Nuclear	84	53.8	57	67.8	0.025	0.874	1.056	0.54-2.06
Joint/three generation	72	46.2	48	66.7				
History of tobacco use								
Yes	114	73.1	82	71.9	4.111	0.043*	2.11	1.01-4.40
No	42	26.9	23	54.7				

Table 2: Association between sociodemographic characteristics and problem drinking among alcohol consumers

*P<0.05 statistically significant at 95% confidence interval

ulcer (OR: 2.82, CI: 1.67–4.76) and the association between them was found to be statistically significant. The current drinkers had increased odds of having diagnosed psychiatric illness like depression, anxiety, and schizophrenia (OR: 8.28, CI: 1.79–38.3) and the association between alcohol consumption and psychiatric illness was found to be statistically significant [Table 5].

Discussion

The pattern of alcohol consumption among alcohol consumers tends to be the major indicator of alcohol-induced morbidity. The results of the study deal with how this problematic drinking pattern affects the alcohol consumers, the problems they face, and the morbidities they suffer from alcohol consumption which are discussed below.

In this study, it was found that the mean age of initiation of drinking was found to be 24 ± 4 years. Around 46.2% and 38.5% of the participants initiated their alcohol drinking practice when they were in the age group of 20–29 years and <20 years, respectively. Similar results were obtained in a study done by Ghosh *et al.* and Ramanan *et al.*[17,18] This early initiation of alcohol consumption might be because of the lack of awareness of hazards of alcohol consumption among the younger generation or compulsion by peer pressure, which would have led them to indulge in drinking alcoholic beverages.

It was found in this study that most of the current drinkers (61.5%) prefer and have their alcoholic beverages at wine shop/bar

and 73.5% of them were found to be problem drinkers. This association between place of alcohol consumption and problem drinking was found to be statistically significant. Nearly 64.1% of the study participants smoke either beedi or cigarette along with alcoholic beverages. Similar results were found in a study done by Ramanan *et al.* and Anand and Roy, alcohol users were more prone to consume tobacco and the preferred place of alcohol consumption were bars or hotels.[18,19] This shows that those who consume alcoholic beverages are more prone to become tobacco smokers and those who consume alcoholic beverages at wine shops/bar are more prone to be problem drinkers. This may be because of the fact that they are not under the supervision of their family members which could lead to heavy episodic alcohol drinking sessions and they could ultimately become problem drinkers.

The most common alcoholic beverage consumed by the alcohol users was brandy (58.3%) followed by whiskey (37.2%) and beer (29.5%). In a study done by Lakshmi *et al.* and Ramanan *et al.*, brandy and whiskey were the most commonly used alcoholic beverages. Brandy and whiskey come under the category of Indian Made Foreign Liquor (IMFL). They contain the highest pure alcohol content when compared with other alcoholic beverages like beer, rum, and vodka. So they may be more prone to face the hazards of alcohol misuse.[11,18]

It was observed in this study that 67.3% of the current drinkers were found to be problem drinkers according to the AUDIT

Table 3: Association between drinking habits and problem drinking among current drinkers

Characteristics	Current drinkers (*n*=156)		Problem drinkers (*n*=105)		Chi-square	OR	95% CI	*P*
	n	%	*n*	%				
Age at initiation of drinking								
<30 years	132	84.6	90	68.2	0.298	1.286	0.52-3.17	0.585
> 30 years	24	15.4	15	62.5				
Duration of the current pattern of drinking								
< 10 years	114	73.1	80	70.2	1.583	1.600	0.76-3.33	0.208
> 10 years	42	26.9	25	59.5				
Last drinking session								
Within last month	113	72.4	75	66.4	0.163	0.855	0.40-1.82	0.686
More than a month ago	43	27.6	30	69.8				
Usual place of consumption of alcohol								
Wine shop/Bar/Street	102	65.4	75	73.5	5.184	2.22	1.11-4.44	0.023*
Home/Friend's Home	54	34.6	30	55.6				
Do you require a morning drink to get things going for that day?								
Yes	29	18.6	23	79.3	2.332	2.104	0.79-5.54	0.127
No	127	81.4	82	64.6				
Beedi/Cigarette along with alcohol consumption								
Yes	100	64.1	69	69	0.363	1.237	0.61-2.46	0.547
No	56	35.9	36	64.3				

*P<0.05 statistically significant at 95% confidence interval

Table 4: Association between social factors and problem drinking among current drinkers

Characteristics	Current drinkers (*n*=156)		Problem drinkers (*n*=105)		Chi-square	*P*	OR	95% CI
	n	%	*n*	%				
With whom do you drink alcohol?								
Alone	50	32.0	37	74	1.498	0.221	1.590	0.75-3.35
Friends/Strangers	106	68.0	68	64.2				
Do you consume alcohol at home?								
Yes	46	29.5	30	65.2	0.130	0.719	0.875	0.42-1.81
No	110	70.5	75	68.2				
Violent behavior because of drinking pattern								
Yes	59	38.0	38	64.4	0.363	0.547	0.810	0.40-1.60
No	97	62.0	67	69.1				
Blackouts after the drinking session								
Yes	35	22.4	22	62.9	0.406	0.524	0.775	0.35-1.7
No	121	77.6	83	68.6				
Did your drinking pattern affect academic/professional life?								
Yes	60	38.5	40	66.7	0.018	0.893	0.954	0.48-1.89
No	96	61.5	65	67.7				
Did your drinking pattern affect personal life?								
Yes	93	59.6	69	74.2	4.962	0.026*	2.156	1.09-4.26
No	63	40.9	36	57.1				
Have you been advised by anyone to cut down alcohol consumption?								
Yes	73	46.8	52	71.2	0.961	0.327	1.402	0.71-2.75
No	83	53.2	53	63.9				
Do you feel guilty after consuming alcohol?								
No	88	56.4	61	69.3	0.371	0.543	1.232	0.62-2.41
Yes	68	43.6	44	64.7				

*P<0.05 statistically significant at 95% confidence interval

questionnaire. However, in a study done by Rajeev *et al.*, 12.8% of current drinkers were found to be problem drinkers.[20] Among the current drinkers in this study, 25% of them had a hazardous drinking pattern, 27.6% of them were having a harmful drinking pattern, and 14.7% of them had a possible dependant drinking pattern. In a study done by Rathod SD *et al.*, it was found that 33.2% had AUDIT scores consistent with hazardous drinking, 3.3% with harmful drinking and 5.5% with dependent drinking.[21] These variations may have been because of the relative difference between the sociodemographic characteristics of the study

Table 5: Alcohol consumption and related health morbidities among the study participants								
Morbidity	Total (*n*=400)		Current Drinkers (*n*=156)		Chi-square	*P*	OR	95% CI
	n	%	*n*	%				
Hypertension								
Yes	74	18.5	38	51.4	5.822	0.016*	1.861	1.11-3.09
No	326	81.5	118	36.2				
Type 2 diabetes mellitus								
Yes	78	19.5	34	43.6	0.858	0.354	1.267	0.76-2.09
No	322	80.5	122	37.9				
Cardiovascular diseases								
Yes	39	9.6	12	30.8	1.231	0.267	0.670	0.32-1.36
No	361	90.4	144	39.9				
Cerebrovascular accidents								
Yes	9	2.3	2	22.2	1.089	0.297	0.440	0.09-2.14
No	391	97.7	154	39.4				
Gastrointestinal diseases								
Yes	72	18.0	43	59.7	15.84	0.000*	2.821	1.67-4.76
No	328	82.0	113	34.5				
Musculoskeletal problems								
Yes	48	12.0	18	37.5	0.052	0.820	0.930	0.49-1.73
No	352	88.0	138	39.2				
Psychiatric illness								
Yes	12	3.0	10	83.3	10.221	0.001*	8.288	1.79-38.3
No	388	97.0	146	37.6				

*$P<0.05$ statistically significant at 95% confidence interval

population. It can be concluded that the prevalence of hazardous and harmful drinking patterns among the current drinkers are high, posing a threat to themselves and others around them. Though the possible dependant alcoholics are less in number, they have to be evaluated and treated for alcohol dependence by a psychiatrist.

Based on the AUDIT questionnaire, current drinkers were classified into four risk zones for the purpose of intervention. In this study, 32.7% of current drinkers belonged to zone I, 25% belonged to zone II, 27.6% belonged to zone III, and 14.7% belonged to zone IV. In a study done by Ramanan *et al.*, it was found that 30.45% belonged to zone I, 41.2% belonged to zone II, and 29.3% belonged to zone III, which shows that there are certain variations when compared with this study.[18] Based on the intervention as recommended by WHO, it can be concluded that nearly 25% of alcohol users (zone II) require simple advice plus brief counselling and continued monitoring and those who belong to zone IV require a referral to specialist for diagnostic evaluation and treatment.

In this study, it was found that 74.2% of current drinkers who had their personal life or quarrels among family members because of their alcohol drinking patterns were problem drinkers. Statistically significant association was found between the personal life of alcohol consumers getting affected by alcohol drinking pattern and problem drinking. In a study done by Ramanan *et al.*, it was found that nearly 60% of the alcohol consumers had a quarrel with family members/neighbors who had their personal life getting affected because of their habit of alcohol consumption.[18]

In this study, 51.4% of those who were previously diagnosed as having hypertension were found to be current alcohol consumers. There was a statistically significant association between hypertension and current alcohol use. In a study done by Howard *et al.*, it was concluded that alcohol consumption increases the risk of developing hypertension for both men and women.[22] In a study done by Ueshima *et al.*, it was proven that reducing alcohol consumption can reduce the blood pressure in hypertensive men. This concludes that alcohol consumption is a major risk factor for the development of hypertension and reducing alcohol consumption plays a major role in the control of hypertension.[23]

In this study, it was found that 83.3% of those who had previously diagnosed psychiatric illness and were taking treatment were found to current consumers of alcohol and 60% of them were found to be possible alcohol dependants as per the AUDIT questionnaire. There was a statistically significant association between alcohol consumption and psychiatric morbidity. In a study done by Kanwar *et al.*, it was found that psychiatric disorders were prevalent in alcohol dependants and lead to more severe alcohol-related problems.[24]

The study outcome shows that 52.5% of the alcohol consumers had a harmful/hazardous pattern of alcohol consumption and 14% were suffering from alcohol dependence. The factors influencing alcohol consumers to indulge in problematic drinking pattern were illiteracy, upper socioeconomic status, being unmarried/divorced, having a history of tobacco use, and consuming alcohol in wine shops. It was found that those who were found to be suffering from chronic conditions were found to be current alcohol consumers.

Primary care and family physicians are the first contacts of all those who suffer from alcohol-related problems in the community. Family physicians play a major role in identifying those at higher risk of indulging in harmful alcohol drinking patterns and provide appropriate referral services, health education, and behavioral change communication. So alcohol consumers can be empowered to abstain from alcohol consumption, thereby many of the alcohol-related problems can be prevented at the community level itself.

Conclusion

This study shows that more than half of those who consume alcoholic beverages (67%) tend to have a problematic drinking pattern. Similar studies need to be carried out to know the burden of problematic drinking by community-based screening so that measures can be taken to identify, counsel and treat those who suffer from alcohol-related problems.

Conflicts of interest

There are no conflicts of interest.

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