

Alcohol consumption in India– An epidemiological review

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ABSTRACT

One of the most important products of global addiction demand is an alcoholic beverage. In developing countries like India, alcohol consumption tends to be a major problem because of the various socio-cultural practices across the nation, different alcohol policies and practices across the various states, lack of awareness of alcohol-related problems among the community, false mass media propaganda about alcohol use, various alcohol drinking patterns among the alcohol consumers and the emergence of social drinking as a habit because of the widespread urbanisation across the country. Stringent alcohol policies are needed across the various states to reduce alcohol consumption, and alcohol consumers have to be educated about the various harmful effects of alcohol consumption and the effects it can have on their mind, body and soul. This review article focuses on the burden of alcohol consumption in context with its various harmful effects on the mind and body with a note on the alcohol policies in the country.

Keywords: Alcoholic, dependence, hazardous drinking, liver cirrhosis

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. There are various types of alcoholic beverages that are consumed around the world. One standard alcoholic beverage corresponds to 10 g of absolute alcohol. The quantity differs among the types of alcoholic beverages. The most commonly used alcoholic beverages are beer, wine, whiskey, rum, vodka, gin and brandy and locally brewed beverages like arrack and toddy. Alcohol consumption becomes a problem when the individual engages in problematic drinking pattern that puts him at the risk of developing adverse health events.^[1] The various drinking patterns of alcohol consumption^[2-5] are given in Table 1.

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Global prevalence of alcohol consumption

According to recent data published by the World Health Organization (WHO), the total per capita consumption of alcohol by individuals above 15 years of age is 6.2 L of pure alcohol per year, which equals 13.5 g of pure alcohol per day. However, there is a wide variation between the WHO regions and member states. Nearly 5.1% of the global burden of disease is attributable to alcohol consumption, and it causes nearly 3.3 million deaths every year.^[1]

Alcohol consumption and its associated factors in various parts of India

Alcohol consumption practices vary across different parts of India because of various socio-cultural diversity and difference in laws governing individual States within India. Table 2 shows the prevalence of alcohol consumption in various parts of India and the associated factors governing alcohol use.^[6-18]

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Table 1: Various patterns of alcohol consumption

The pattern of alcohol consumption	Definition
Social Drinking	Social drinking or moderate drinking refers to: Men not having more than two drinks per day. Women not having more than one drink per day. It refers to the use of alcohol in a single day and not an average over several days. ^[2]
Binge drinking	It refers to the consumption of the following number of alcoholic drinks in a period of about 2 h: Men consuming five or more alcoholic drinks on a single occasion. Women consuming four or more drinks for women. ^[3]
Harmful drinking pattern	Alcohol consumption pattern that results in physical or psychological harm to the individual or society. This disorder is also recognized by the WHO. ^[4]
Hazardous drinking pattern	It is defined as a quantity or pattern of alcohol consumption that places individuals at risk for adverse health events. ^[3]
Alcohol dependence	It is defined as a cluster of behavioural, cognitive and physiological phenomena that develop after repeated alcohol use and that typically include a strong desire to consume alcohol, difficulties in controlling its use, persisting in its use despite harmful consequences, a higher priority given to alcohol use than to other activities and obligations, increased tolerance and, sometimes, a physiological withdrawal state. ^[5]

WHO: World Health Organization

Disease burden because of alcohol consumption

a) At the global level:

Alcohol use disorder (AUD) (which includes a level that is sometimes called alcoholism) 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. The prevalence of AUDs is highest in Europe (7.5%) and the lowest among eastern Mediterranean regions, which includes Afghanistan, Bahrain and Egypt. Globally, 50% of the deaths caused by liver cirrhosis, 30% of the deaths because of oral and pharyngeal cancers, 22% of the deaths caused by inter-personal violence, 22% of the deaths because of self-harm, 15% of the deaths caused by traffic injuries, 12% of the deaths because of tuberculosis (TB) and 12% of the deaths caused by liver cancer were attributed to alcohol consumption.^[1]

b) At the national level:

The 12-month prevalence of AUDs in India in the year 2010 was 2.6% and that of alcohol dependence was 2.1%. In 2012, 33.1% of all the road traffic accident deaths were attributable to drunk and driving. The National Mental Health Survey of India 2015–16 found the prevalence of AUDs to be 9% in adult men. In India, the alcohol-attributable fraction (AAF) of all cause deaths was found to be 5.4%. Around 62.9%

of all the deaths due to liver cirrhosis were attributable to alcohol use.^[19]

Medical consequences of alcohol use

When alcoholic beverages are consumed, alcohol gets absorbed from the stomach and small intestine. It is distributed through blood circulation to every organ in the body. The alcohol gets absorbed by the liver at a rapid pace and excreted through the kidneys, which accounts for 95% to 98% of the alcohol consumed.^[5] In a study done by Gururaj *et al.*, it was concluded that, because of the increase in the alcohol consumption occurring all over the country, the hospital admission rates because of alcohol consumption were also increasing with 20% to 30% of admissions because of direct or indirect problems caused because of alcohol consumption.^[20]

The various medical complications because of alcohol consumption are:

- Gastrointestinal (GI) complications:** The direct effect of alcohol on the lining of the stomach can lead to acute gastritis and present as vomiting, usually associated with heavy drinking. Repeated damage can lead to hyperacidity leading to peptic ulcer disease. Alcohol is one of the most important reasons for haemorrhagic gastritis. The most common complication of long-term alcohol is alcoholic liver disease (ALD)^[5]
- Cancer:** Drinking as few as 1.5 drinks per day increases a woman's risk of breast cancer 1.4-fold. For both the genders, four drinks per day increase the risk for oral and oesophageal cancers by approximately three-fold and rectal cancers by 1.5 fold.^[5] In a study done by Bangardi *et al.*, it was found that alcohol most strongly increased the risk of cancers of the pharynx, oral cavity, oesophagus and larynx^[21]
- Changes in the genitourinary system:** Acutely, modest doses of ethanol can not only increase sexual drive but can also lead to decrease in the erectile capacity in men. Even in the absence of liver impairment, significant minority of chronic alcoholic men show irreversible testicular atrophy with shrinkage of seminiferous tubules, resulting in decrease in ejaculate volume and a low sperm count.^[22] In a study done by Chandra *et al.*, it was found that there was disproportionately high association of alcohol abuse with high-risk sexual behaviour and HIV infection^[23]
- Muscular changes:** Between one-half and two-thirds of alcoholics can have skeletal muscle weakness caused by the acute alcoholic myopathy, which may improve with abstinence, but it is not fully cured. Effects of alcohol consumption on the skeletal system can include lower bone density.^[22] In a study done by Venkat *et al.*, it was found that those who suffer from chronic alcoholism suffered from avascular necrosis of the femoral head and reduced bone density.^[24]
- Neurological complications:** The short-term effects of alcohol consumption that can get relieved after stopping alcohol consumption include blackouts, blurred vision,

Table 2: Alcohol consumption and its associated factors in various parts of India

Author, location, year of study	Result
Girish <i>et al.</i> , ^[6] Bangalore, 2010	Prevalence of alcohol consumption- 23.7% Preferred alcoholic beverage- Whisky and arrack Binge drinking- 29.6% Heavy alcohol users- 17% Reason for alcohol use- Habituation and peer pressure
Ghosh <i>et al.</i> , ^[7] Kolkata, 2012	Prevalence of alcohol consumption- 65.8% Mean age at initiation of drinking alcoholic beverages- 20.8+5.9 years. Statistically significant association was found between drinking alone, not concerned about drinking habit and harmful/hazardous drinking pattern ($P<0.05$).
Kumar <i>et al.</i> , ^[8] Vilupuram district, 2013	Prevalence of alcohol consumption- 16.8% Age at the initiation of drinking- 25.3+9 years Statistically significant association was found between illiteracy, lower education levels and smoking and alcohol use ($P<0.05$). Hazardous drinkers- 29.2% Alcohol dependence- 56.2%
Lakshmi <i>et al.</i> , ^[9] The urban area of Chennai, 2014	Prevalence of alcohol consumption- 42.65% Problem drinking- 38.8% Reason for alcohol consumption- To overcome stress or tiredness Quarrels among families because of alcohol use- 84.5% Associated morbidity: Gastritis- 33% Hypertension- 13.8% Diabetes- 9.5%
Dewan <i>et al.</i> , ^[10] Bangladesh, 2015	Prevalence of alcohol consumption- 3.8% Heavy drinking- 20.2% Alcohol dependence- 0.7% Morbidity: Liver abscess- 79.7% Ischaemic heart disease- 38.7%
Vidhukumar <i>et al.</i> , ^[11] Kerala, 2016	Prevalence of alcohol consumption- 28.78% Hazardous alcohol use- 14% Alcohol dependence- 2.6%
Ramanan <i>et al.</i> , ^[12] Puducherry, 2016	Prevalence of alcohol consumption- 17.1% Statistically significant association was found between younger age group, marital status, illiteracy and alcohol use ($P<0.05$).
Manimunda <i>et al.</i> , ^[13] Andaman and Nicobar Islands, 2017	Prevalence of alcohol consumption- 35% Statistically significant association was found between the younger age group. Employment status and alcohol use ($P<0.05$)
Bute <i>et al.</i> , ^[14] Rural Indore, 2018	Prevalence of alcohol consumption- 38.2% Statistically significant association between alcohol use and education status, tobacco use, occupation and positive family history of alcohol use. Reason for alcohol consumption: Enjoyment Stress buster Peer pressure.
Eashwar <i>et al.</i> , ^[15,16] Kancheepuram district, 2019	Prevalence of alcohol consumption- 39% Problem drinking- 67.3% Harmful hazardous drinking pattern- 52.5% Dependent alcohol drinking pattern- 14.7%
Teli <i>et al.</i> , ^[17] Dehradun, 2019	Prevalence of alcohol consumption- 44%
Wangdi <i>et al.</i> , ^[18] Bhutan, 2019	Prevalence of alcohol consumption- 30.9% Statistically significant association between alcohol use and male sex, widowhood and tobacco consumption

impaired memory and slower reaction times.^[25] In a study done by Peng *et al.*, it was found that chronic alcohol use can lead to the development of alcoholic tremors, myopathy, Wernicke's encephalopathy and cerebellar degeneration^[26]

f. Psychiatric complications: Consuming alcoholic beverages to overcome depression and anxiety has been a common practice. Though alcohol can relieve those conditions to some extent initially, it starts to deplete the neurotransmitter serotonin in the brain, causing depression and anxiety and

the need to consume more alcohol to medicate depression arises. This chronic use can lead to increased risk for suicide, personality disorders and risk-taking behaviours.^[26] Problems related to alcohol consumption made up to 17.6% of psychiatric emergencies in an Indian general hospital.^[27] In a case-control study of completed suicides in Bangalore done by Gururaj, it was found that alcohol consumption was a major risk factor for suicide with nearly a 25 times increase among the alcohol users. Suicide rates among women

increased by nearly six times who were a spouse of alcohol abusers.^[20] A study done by Vijayakumar *et al.*, in Chennai, found that suicide rates were higher among alcohol users as compared with non-users.^[28]

Social consequences of alcohol use

Alcohol consumption not only affects the individuals but also his family members get affected in one way or the other. The person in an intoxicated state may indulge in domestic violence with his family members; may exhaust the savings of the family, which can negatively affect the education of his children, and the children of alcoholic fathers will have strained relationship with their family members, which can affect their psychological wellbeing. In a study done by Gururaj *et al.*, in Bangalore, it was found that emotionally abusing the spouse was found to be 2.5 times more common among persons who consume alcohol, 23.3% of the users physically abused their spouse and 7.8% of them physically abused their spouse resulting in injuries.^[29] In a study done by Markowitz *et al.*, domestic violence was reported by 20% of women and husband's practice of alcohol consumption was reported by them as the most significant cause for domestic violence.^[30]

Impact of alcohol use on economic and family finances

The economic impact of alcohol consumption plays a major role in families belonging to lower socio-economic strata. In a study done by Bonu *et al.*, it was found that there was an empirical association found between the use of alcohol and tobacco and impoverishment through borrowing and selling off assets in distress because of hospitalisation.^[30]

In a study done by Benegal *et al.*, it was found that alcohol-dependent persons spent more money than they earned, they were forced to take loans to spend for their expenses related to alcohol consumption, on an average, 12.2 working days were lost to the habit and around 60% of the families were financially supported by the income from other family members.^[31] In a study done by Ramanan *et al.*, half of the persons who consume alcoholic beverages had strained relations with their family members especially their spouse and children.^[12]

Road traffic accidents

One of the major problem of alcohol consumption are road traffic accidents which occur due to driving vehicles under the influence of alcoholic beverages. Both developing and developed countries report high rates of road traffic accidents because of alcohol consumption.^[5]

In a study conducted by the National Institute of Mental Health and Neurosciences (NIMHANS) in 12 major hospitals of Bangalore city, it was found that nearly 28% of injuries because of road traffic accidents were directly attributable to alcohol. The roadside survey revealed that nearly up to 40% of the drivers were under the influence of alcohol.^[31,32] In a study

done by Aditya *et al.*, it was found that 20% of the fatal road traffic accidents were because of alcohol use. The blood alcohol concentration (BAC) of 38% of those alcohol users were above the permissible limits.^[27] In a study done by Gururaj it was found that alcohol abuse was reported in over 20% of the traumatic brain injuries.^[33] According to the latest data released by the National Crime Records Bureau (2015), Tamil Nadu recorded the highest number of drunk and driving accidents in the country.^[34] In a study done by Korlakunta *et al.*, high-risk behaviour was more common among alcohol-dependent individuals with road traffic accidents being the most frequently observed.^[35]

Legal problems because of alcohol consumption

Another important area where complications arise because of alcohol abuse is legal problems. Crimes that are committed following alcohol intoxication include sexual/physical assault, rape, exploitation of women in commercial sex work and homicide. According to the National Crime Records Bureau of India, the different crimes that are related to alcohol consumption fall under four major acts namely, the Prohibition Act, Gambling Act, Psychotropic Substance Act and Excise Act. However, the major reason because of which the public nuisance created because of alcohol abuse goes unnoticed is that those crimes are classified under petty crime and they largely go unrecognised or they may get overlooked.^[29]

Benefits of alcohol consumption

There are many studies that have pointed out that drinking alcohol in moderate amounts is good for the heart as they help in preventing coronary artery diseases (CADs). However, individual susceptibility plays a major role in the protective benefits of alcohol consumption. The American Heart Association (AHA) states that 'it is not possible to predict in which people alcoholism will become a problem' and advice not to consume alcohol for the benefits it may carry.^[36]

In a multi-centre study done in India, it was found that even light or occasional consumption of alcohol might increase the risk of CAD. So, the benefits of alcohol consumption may not be true for Indians at least.^[37]

Alcohol policy in India

Although the prohibition of alcohol use is encouraged in the constitution of India, alcohol policy is a state subject. States are having full control of alcohol-related legislation, excise rates and the production, distribution and sale of alcohol. Newly independent India, which was born post-independence, retained alcohol prohibition until mid-1960s, and by 1970, only the state of Gujarat had a complete alcohol prohibition policy.^[29] In Bihar, there is complete prohibition of alcohol use since 4 April 2016. However, following a year after the ban, trade of illicit liquor flourished along the borders, as the neighbouring states have no prohibition on alcohol. In addition, there seems to be illicit trade of narcotic drugs as people have begun to look for other substances for addiction.^[38]

Another controversial 'Dry State' is Manipur, where the prohibition of alcohol consumption is in force since 1991, but scheduled castes (SCs) and scheduled tribes (STs) were allowed to brew their traditional liquor. In 2002, the government lifted the ban of alcohol in some districts in Manipur. Manipur is now popularly called 'Wettest Dry State'. Government is now looking to remove the prohibition act, as illicit liquor use, deaths because of methanol poisoning and substance abuse are on the rise.^[39] The major reason states experience fluctuation on the alcohol prohibition at the policy level is that it generates nearly 15% to 20% of their revenue from alcohol taxation, contributing a significant amount to the state treasury.^[40] In states like Gujarat, where complete prohibition is in force, the rich have continued access to alcoholic beverages and the lower class and poor people resort to illegal brewing of alcohol with increase in deaths because of methanol poisoning.^[39] In countries like United States of America (USA) increased taxation on alcoholic beverages has been used to reduce alcohol consumption. In India, those measures will not work, as the alcohol consumers have easy access to illicit liquor and substances. Other laws related to the regulation of alcohol-use like hours of sale, drunken driving and sale to minors are regularly breached.^[41] Legal drinking age is the minimum age after which a person is allowed to buy alcohol. The legal age in different states in India is given in Table 3.^[42]

Drunken driving (Motor Vehicle Act)

When a person consumes an alcoholic beverage, there is a rise in BAC because of which there is gradual and progressive loss of driving ability because of increase in the reaction time, overconfidence, degraded muscle coordination, impaired concentration and decreased auditory and visual acuity. This is known as drunken driving. There are laws to govern drunken driving in India. The BAC limits are fixed at 0.03%. As per the Motor Vehicle Act, any person whose BAC values are found to be more than this limit are booked under the first offence and may be fined about INR 2,000 to 10,000 and/or he or she may face a maximum of 6 months to 4 years imprisonment.^[43]

Alcohol advertisements

As per the Cable Television Network (Regulation) Amendment Bill, advertising of alcoholic beverages was banned in India. Still, private channels are often permitting alcohol companies to advertise using surrogate means like using brand names for soda

or water or music. However, as the target audience is moving from watching television to mobile phones, liquor companies have now begun to invest in online video marketing.^[43,44]

Alcohol prohibition in Tamil Nadu

Before independence, the Madras Abkari Act, imposed in the year 1886, enacted strict rules and regulations that prohibited the local manufacturing of alcoholic beverages and confined it to the central distilleries, where excise duty was paid to the government before being sold in the market. This favoured foreign liquors resulted in anti-alcohol agitation by Indian freedom movements like Swadeshi and Non-Cooperation Movement. In 1937, alcohol prohibition was imposed in Salem district, which was later extended throughout the presidency.^[45] After independence, Tamil Nadu continued liquor ban until 1971. After 1971, the then chief minister (CM) lifted the prohibition of alcoholic beverages. Again, in 1981, the CM during that period closed down all arrack and toddy shops but left the Indian-made foreign liquor untouched. That was the time when it was noticed that, whenever alcohol prohibition was imposed, illegal sales of toddy and arrack and consumption of methanol would rise, resulting in loss of many lives; thus, the ban would be lifted.^[6] In 2002, the retail sale of alcohol was brought under government control. A panel of five IAS officers governs it. It has nearly 6,800 retail alcohol outlets across the state.^[46] As of now, no steps are being taken by the government on the sale and consumption of alcoholic beverages in the state.

Primary care intervention for alcohol-related problems

In developing countries like India, primary care physicians are the first contact of patients with the healthcare system. It is a major platform for screening to identify at-risk individuals and diagnose AUDs. As recommended by the WHO, the AUDs Identification Test (AUDIT), for use in a primary care setting, is a validated screening tool. It can be used to identify alcohol consumers who are harmful/hazardous drinkers and alcohol-dependent individuals.^[2,47,48] Systematic reviews and randomised controlled trials (RCTs) have demonstrated that brief intervention in primary care setting by one-to-one counselling can help at-risk drinkers and those with mild alcohol-related problems.^[49] Based on evidence, primary care management of alcohol-related problems include three core steps, namely, counselling the patient on the ill-effects of alcohol and, if necessary, prescribing medications like disulfiram and connecting with the patients by organizing treatment programs and forming support groups. If necessary, they have to refer the patient to higher centres for further care and management.^[50-53]

Conclusion

Alcohol consumption is emerging as a major public health problem in India. Multi-centric scientific community-based research studies have to be conducted in various individual states to understand the problem better. Various policymakers,

Table 3: Legal drinking age in various states in the country^[42]

Legal drinking age	State/Union Territory
Illegal (Complete ban on alcohol use)	Bihar, Gujarat, Lakshadweep, Nagaland and partial prohibition in Manipur.
18	Goa, Haryana, Himachal Pradesh, Jammu and Kashmir, Puducherry and Sikkim.
21	Andaman and Nicobar, Arunachal Pradesh, Andhra Pradesh, Uttar Pradesh, Assam, Jharkhand, Tamil Nadu and Telangana.
25	Chandigarh, Damn and Diu, Delhi and Punjab.

media, professionals and society have to be educated about the consequences of chronic alcohol through sensitisation programmes and health education campaigns. There is a dire need for rational alcohol control policy with specific objectives like alcohol taxation, production and promotion policy.

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Conflicts of interest

There are no conflicts of interest.

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