

**PREVALENCE AND CORRELATES OF ALCOHOL
USE AMONG MEN IN RURAL TAMIL NADU**

**Dissertation submitted in partial fulfillment of the requirement
of The Tamil Nadu Dr M.G.R. Medical University
For the M.D. Branch XV (Community Medicine)
Examination to be held in April 2015**

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ACRONYMS

AUD	Alcohol Use Disorders
AUDIT	Alcohol Use Disorders Identification Test
CAGE	Cut Annoyed Guilty Eye
CHD	Coronary Heart Disease
CSW	Commercial Sex Worker
FAS	Foetal Alcohol Syndrome
FASD	Foetal Alcohol Spectrum Disorder
FSW	Female Sex Worker
GENACIS	Gender, Alcohol and Culture: an International Study
GOI	Government of India
ICMR	Indian Council for Medical Research
IMFL	Indian Manufactured Foreign Liquor
MSW	Male Sex Workers
NFHS	National Family Health Survey
RANDS	Regan Attitudes toward Non-Drinkers Scale
RUHSA	Rural Unit for Health and Social Affairs
SES	Socio- Economic Status
STI	Sexually Transmitted Infection
TASMAC	Tamil Nadu State Marketing Corporation
TRC	Tuberculosis Research Centre
UN	United Nations
WHO	World Health Organization

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ABSTRACT

Title: Prevalence and correlates of alcohol use among men in rural Tamil Nadu

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Name of Guide: Dr. Rita Caroline Isaac

Background: The production and consumption of alcohol has been on the rise over the past few decades and India has emerged as one of the largest producers of alcohol in the world. It has been shown that sizeable proportions of hospital admissions in India are due to alcohol related problems. Few studies have shown that there is a moderate to high prevalence of alcohol use in the rural areas of India. In order to plan effective interventions to address alcohol related social and health issues, there is a need to understand the actual prevalence of alcohol use by young people, environment in which they drink and the factors that prevent or worsen the drinking habit.

Objectives: 1) To assess the prevalence and patterns of alcohol consumption amongst 20 – 35 year old males in a rural community in South India. 2) To identify the factors associated with problem drinking amongst 20 – 35 year old males in a rural community in South India.

Methods: A cross-sectional study was conducted among a sample of 300 randomly selected, 20-35 year individuals from the rural developmental block of K.V. Kuppam, Vellore district, Tamil Nadu, to assess the prevalence of alcohol use and the proportion of problem drinkers. A case-control analysis approach was used to assess factors related to problem drinking. A cluster random sampling technique was used to select the participants. A structured questionnaire including socio-demographic characteristics, alcohol related information, AUDIT questionnaire, correlates of alcohol use and Regan Attitude towards Non-drinkers Scale (RANDS) was administered in a door to door survey. The AUDIT score was used to classify individuals as non-drinkers, non-problem drinkers and problem drinkers. Univariate, bivariate and multivariate analyses were done to describe the prevalence and patterns of alcohol use and to identify the independent risk or protective factors for problem drinking.

Results: From the study population 89 participants were categorized as problem drinkers as they had an AUDIT score ≥ 8 and the rest 211 participants (non-drinkers and non-problem drinkers) formed the control group. The prevalence of ever users of alcohol was 54.3% and the prevalence of current users was 49.7% with 59.7% of them being problem drinkers. The most common age of initiation of alcohol use was 20 years and the reported minimum age of first drink was 12 years. Most of the problem drinkers were in the age bracket of 25-29 years. Beer followed by IMFL was reported to be the commonly used drinks. The most common reasons quoted for alcohol use were for entertainment, means to socialize and for relaxation and time pass. Among all the risk factors, peer influence as measured by friends consuming alcohol, emerged as the strongest risk factor for becoming a problem drinker and the other independent

significant risk factor for problem drinking was poor socio-economic status. A positive attitude towards non-drinkers, as assessed by the RANDS score, was found to significantly prevent individuals from becoming problem drinkers.

Conclusion: About 50% of young people consume alcohol in the rural areas and 30% of the young men are problem drinkers. If a positive attitude towards non-drinkers can be engendered with communication for behavioural modifications and in addition implementation of poverty alleviation projects, recreational activities for rural youth etc. will bring about a substantial reduction in alcoholism in the future.

Key Words: alcohol, prevalence, problem drinking, non-problem drinking, non-drinkers, ever users of alcohol, age of initiation, ICMR socio-economic status, K.V. Kuppam block, south India, AUDIT questionnaire, RANDS score, attitude peer pressure, consumption by friends.

1 INTRODUCTION AND JUSTIFICATION

1.1 MAGNITUDE OF THE PROBLEM

In the 32nd World Health Assembly it was declared that “problems related to alcohol and particularly to its excessive consumption rank among the world's major public health problems and constitute serious hazards for human health, welfare and life” (1). The World Health Organization (WHO) estimated that there are about two billion consumers of alcoholic beverages and 76.3 million people with diagnosable alcohol-use disorders worldwide (2). All over the world, alcohol-abuse has emerged as a major problem and attributes towards high mortality and morbidity.

1.2 INDIAN SCENARIO

Consumption of alcohol has markedly increased in India in the recent decades and India has emerged as one of the largest producers of alcohol in the world. There has been a steady increase in alcohol production over the last 15 years (3). Production doubled from 887.2 million litres in 1992-93 to 1,654 million litres in 1999-2000. It was expected to treble to 2,300 million litres by 2007-08 (3).

In a survey conducted in 2005 by GOI and UN office on drugs and crime it was estimated that the burden of alcohol users was 62.5 million, with 17.4% of them (10.6 million) being dependent users and 20–30% of hospital admissions were due to alcohol-related problems (4). Few studies have been done in both urban and rural set up, which have shown that there is a moderate to high prevalence of

alcohol consumption in India and consumers have been classified as hazardous or harmful consumers and non-hazardous or non-harmful consumers (5), (6), (7), (8), (9). In a study done by an urban health centre in Kolkata, the mean age for initiation of alcohol consumption was determined to be 20.8+5.9 years (5). Nearly two-thirds consumed alcohol in liquor-shops, restaurants, bars and pubs (7), (9).

The types of alcohol frequently consumed in rural areas were locally brewed rice beer (handia), palm wine (tadi), distilled country liquor (chullu), and so-called Indian-made foreign liquor (IMFL) with arrack (35%) being consumed maximally in rural areas (7), (9).

1.3 PROBLEMS OF HAZARDOUS DRINKING

A study conducted by Johnson et al in Bangalore, reported a high prevalence (37%) of problem drinking among adults from a rural population (8). Another study done by D'Costa G et al in a primary care setting in Goa reported that harmful drinking was a major perpetrator of physical violence (10). Other effects of problem drinking that have been reported are social disturbances, family discord, and domestic violence (11). Nearly 41% of alcohol users, consumed alcohol at public places and workplaces, which may be socially harmful (5).

1.4 BURDEN OF ALCOHOL CONSUMPTION IN INDIA

From study done in a rural block in Vellore district by John A et al in Community Health Department Christian Medical College, Vellore it was reported that

the prevalence of life-time use of alcohol as 46.7% (12). A recent study done by Kumar et al in Villupuram, Tamilnadu reported 9.4% of prevalence of alcohol use among men from rural Tamil Nadu (13).

The cause of alcoholism is multifactorial. In a study done in Bangalore by N. Girish et al it was found that the proportion of alcohol users in all age group were greater in town (15.7%) than rural and among the alcohol consumers, 67.4% belonged to 26 – 45 years age group. Moreover nearly two-thirds were long-term users and the proportions were greater in the rural than the town areas (7). It was also noted that nearly half (45%) of rural alcohol consumers were very frequent users (consuming daily or every alternate day) as against users in towns (23%) or slums (20%) (7).

1.5 FACTORS RELATED TO ALCOHOL CONSUMPTION

The common causes of rise in alcohol consumption has been attributed in all the studies done so far to ready availability, increased production and marketing, advertising and promotion (6) and peer pressure (7), (12), (14), (15), (16). Nearly 77.4% of alcohol consumers reported regular drinking in groups of four friends or more and 33.9% consumed four to five drinks in an episode (14). It was also noted that drinking due to peer pressure was related to an increased measure of unsupervised drinking (11), (15), (17). The other factors which have been suggested to be risk factors for problem drinking are easy availability (6) special offer prices, presence of brewery in the village, smoking , lower education and lower standard of living (12), (17).

In addition to many of the common risk factors listed above for the problem drinking found in men in India, there may be other factors that can significantly influence drinking. There is a need to understand the social and environmental background of young men in the rural areas and their perception regarding drinking in order to plan effective interventions to reduce the drinking menace in rural India. We hypothesized that negative attitude towards non-drinkers could be a significant risk factor for taking up drinking early in life and other environmental and social factors will later promote its continuing use and becoming problem drinkers. **Therefore, in this research, in addition to assessing social factors promoting drinking habit in young people in the age group of 20-35 years, it was designed to also assess the negative attitude of problem drinkers towards non-drinkers as a significant risk factor for problem drinking.** The hypothesis is assessed using a questionnaire developed by Daniel Reagan et al from National University of Ireland, Galway, Ireland testing the assumption that consumption of alcohol may serve as a means of avoiding the social costs associated with being a non-drinker. An 11-item validated scale - Regan Attitudes toward Non-Drinkers Scale (RANDS) to assess the attitude towards non-drinkers. The results indicated that scale score reliability for the RANDS was good (α values range from .82 to .89) with exploratory and confirmatory factor analyses suggesting that the scale possesses a unidimensional factor structure. Scores on the RANDS emerged as a stronger predictor of self-reported yearly alcohol consumption and binge drinking than indicants commonly assessed in alcohol use and abuse research in adolescents and young adults (18), (19).

2 LITERATURE REVIEW

2.1 GLOBAL SCENARIO

Since the very beginning of history being recorded, use of alcoholic beverages in human societies, have qualified for mention(20). Till date, alcohol addiction has been a major social problem envisaged by every country world over(21). Misuse of alcohol is considered to be a massive public health problem, which has resulted in more health-related issues as compared to illicit substances and tobacco abuse(22). Innumerable research has been conducted to establish the relation between factors contributing to alcohol consumption and also the health outcomes of drinking. Both contributors and outcomes are multidimensional and complex(20).

The paradigms of alcohol intake are varied and are in a constant state of evolution and modification. Europe has been a substantial facilitator of alcohol use in the developing countries. It continues to exert direct and indirect influence even now. Improved international cooperation on policy issues and scientific research has a high chance in achieving the aims of limitation of alcohol consumption and prevention of alcohol-related social and health problems, in not only Europe, but in the worldwide scenario (23). A study conducted by WHO on a global level to estimate the average amount of alcohol usage and the drinking patterns revealed a distinctive variation in both dimensions, in between various WHO subregions. There was a marked difference with reference to the volume of consumption in established markets as compared to the variable market economies. The most detrimental patterns of drinking were observed from Middle

and South America, some African countries and from former Socialist countries in Eastern Europe; in contrast to developed countries of West Pacific region and Western Europe, where the pattern of alcohol use was least detrimental. In spite of these observed variations, the overall average volume of alcohol usage is inarguably high and so are the patterns of consumption hazardous (24). Although the developing countries have an overall lower per capita alcohol consumption as compared to European countries, the pace at which it has increased over recent years, has been highly significant from the perspective of public health (23). Southeast Asia inclusive of India, has been predicted to have a significant increase in the average amount of drinking and different cultural practices seem to influence the patterns of alcohol intake (20). This observation has been reiterated by Lam et al where they have concluded that even though 3.8% of global deaths and 4.6% of worldwide disability-adjusted life years (as of 2004) was contributed by China and South-East Asia, alcohol consumption has been rapidly increasing in this region(25). In a study conducted in Canada among Latin American, Indo-Pakistani, and Chinese communities with regard to various domains of the Neuber's Community Needs Assessment model, it was seen that the contributory factors and problems of alcoholism are minimal within the Chinese community and far more grave in the Indo-Pakistani and Latin American communities(26). In a paper which explored the relation between drinking behavior, alcohol-related mortality and macro-economy of Finland, taking into account aggregate and micro-level data, disclosed that an improved economic condition produced a reduction of alcohol-related mortality and indulgence in

alcohol increased at the time of economic expansion but the probability of becoming a drinker remained unchanged (27).

Proportion of adolescents misusing alcohol is rising and drinking in excess is associated with social, physical, and psychological harm to the society, family and individual (22). Even though young people are aware of the detrimental effects on health and social determinants, curbing the overuse of alcoholic beverages seems to be a difficult proposition (21).

Unrestricted alcohol drinking spurs substantial negativism on health and quality of life among alcoholics and their families. It is also responsible for considerable direct and indirect costs, which may be difficult to be borne by developing countries (23). In supplement, diseases which have been predicted to have a buoyant effect on the global burden, have been associated with alcohol. Hence, it is deemed worthy to effectuate appropriate policies with target towards harm reduction strategies (20).

In an attempt to assess the prevalent policies of public health related to problems/ issues of alcoholism, the determined set goals and targets and the proposed strategic directives, an evaluation of policies of 12 developed countries was undertaken. The results of the assessment revealed uniformity with regard to the adverse outcomes of alcohol like social disruption, increase in crime rates, considerable self-harm and harm to family well-being, and ultimately ensuing in economic loss. All the countries were concerned about young adults consuming alcohol and also about excessive and hazardous drinkers. Only a few countries aimed at reduction of total consumption, of which only five countries specified

targets for modification of drinking behaviour. Among all the countries, Australia and New Zealand, could be applauded for having well designed intervention programs in most areas (28). In order to strengthen the face of intervention and prevent alcohol from being misused, it is essential to take steps to facilitate sharing of information, develop policies that are compatible and invoke health measures that are culturally acceptable. For achieving success in this front, the need for a global outlook on alcohol is paramount (23).

2.2 INDIAN SCENARIO

In this section, it has been attempted to briefly reveal the past and present alcohol praxis in the Indian cultural context. The Indian scenario has been elaborated under the following sub-topics:

2.2.1 ANCIENT TIMES

From time immemorial, use of alcohol has been an ambivalent issue in the history of India. The attitudes and outlooks towards alcohol consumption in India are complex and nebulous because of the various influences of the diverse Indian history. The birth of variegated patterns of alcoholism can be classified into four major historical periods within the realm of India's history viz. Vedic era (1500-700 BC), the period of Buddhism and Jainism (700 BC to 1100 AD), influence of Islamic rule (1100-1800 AD) and the establishment of British colonial empire and post independence era (1800 to the present day). In the Vedic times, alcohol was an accepted norm of society and its use was prevalent. Emergence of Jainism and Buddhism brought about a change in the practice, as they professed doctrines against intoxication. This act was supported by the post-Vedic period

scholars who promoted strict virtues of Hinduism. The cumulative effect was the birth of the concept of moderate alcohol use. In spite of the Quran opposing alcohol consumption, the dawn of the Islamic and Mughal rule witnessed the re-emergence of a complex conflicting pattern of alcohol use. Thereafter, with the British Empire setting foot on Indian soil, the vices of the European nation was brought to the doorsteps of the relatively conservative Indian culture. Even though certain sections of the Indian community oppose alcohol addiction, the yoke of alcoholism is yet to be revoked (29).

2.2.2 TRANSITION PERIOD

The British colonial era brought about a rapid social change of attitude towards drinking. Prior to colonization, only the Brahmin caste disregarded the practice of consuming alcohol, while the rest of the country had a relaxed outlook towards drinking. With improvement in trade opportunities, industrialization and influx of newer living styles heralded by the British, a drastic change of socio-economic empowerment ensued, which led to the emergence of a nouveau riche section of society termed as the “urban middle class”. Individuals belonging to this section of society deemed themselves contemporary to the higher castes and started adopting their practices. Abstaining from drinking locally brewed illicit liquor became the norm. Parallel to this changing behaviour, the monopolization of liquor production and procurement by the British government was entrenched by imposing excise duty on alcohol and restricting the manufacture of alcoholic beverages only to licensed government distilleries. This again brought in a shift of drinking pattern. The lower rungs of society resorted to indulging in illicit alcohol

use to transcend their misery and drinking among the upper classes, in accordance to foreign customs, was a luxurious affectation. As the struggle of independence progressed, Gandhi and the nationalist movement utilized the temperament of the middle class in mobilizing mass movements against drinking to symbolize the fight against colonial oppression. They strove to make the Indian nation ritually pure and demanded for total prohibition. The Constituent Assembly of independent India included prohibition as one of the Directive Principles of state policy(30).

In the current state of affairs, the second highest source of most of the states' exchequers is the revenue obtained from alcohol taxation, which contributes to nearly 15–20% of the total revenue. The alcohol beverage industry holds a substantial influence on the political scenario of not only the States but also on a national level. This political partisan has been reflected in the attributes of the general population, which is evidenced by:

- Drink-related hazards emerging as major public-health problem in India as a consequence of increased production, distribution, and promotion (31).
- Lowering of age at initiation of drinking - In a study conducted in Karnataka, a decrease in mean age from 28 years to 20 years was noted between the birth cohorts of 1920–30 and 1980–90 (30).
- A steady growth rate of 7–8% over the past few years has been registered in the sale of alcohol (30), (31). The most prominent expansion observed was in south India (30).

- Country liquor and whisky have given way to beer, white spirits and wine(30).
- Mushrooming of city bars and nightclubs within the past few years (31).
- Changing trend of urban women and young people indulging in drinking, and a significant rise in the proportion of urban middle and upper socio-economic sections consuming alcohol (30). The signature pattern of alcohol use in India is frequent and heavy drinking (31).

Multinational companies have realized the potential market in India and have sought for investment. Even though electronic and print media have banned alcohol advertising, surrogate advertising is overwhelming (31).

Nonetheless, alcohol use for the majority in India, is still stigmatized (30).

2.2.3 HABIT PATTERN

As has been discussed above, the pattern of drinking has changed from that of occasional and ritualistic use to an acceptable leisure activity for men. In a study from Bangalore, it was reported that nearly one-fourth of adult men took alcohol. The observed increase in alcohol use in urban and semi-urban areas is attributed to increased commercial production and easy availability of alcohol. Hazardous drinking has been reported from both higher educational and income levels and from lower socioeconomic backgrounds (32). A cross-sectional study of four different populations, i.e. rural, township, urban and slum showed that a male predominance pattern was ubiquitous and the preferred drink was hard liquor. Most of the consumers were inadequately educated, were unskilled workers and were married adults. The characteristics of a rural user were: young illiterate

male, involved in hard physical labour hailing from a low socio-economic status; preferring hard alcoholic drinks like arrack on a regular basis and usually consuming at home or in a retail alcohol outlet. In comparison, the characteristics of an urban user were: young literate male, employed in a skilled job, indulging in alcohol at least once in a week, with a high preference for beer and the usual place of consumption being a commercial establishment like restaurant, bar or pub. Township users followed a pattern similar to the urban drinkers, while the slum dwellers mimicked the rural drinker pattern, albeit individual differences in patterns being noted (7). Further, the pattern of drinking among tribal population was found to be similar to the rural population with an increasing rate of consumption of both licit and illicit alcohol, as was revealed in a study conducted among the scheduled tribe of Paniyas of Kerala (33). In a research on the socio-demographic correlates of alcohol consumption among 4670 persons above 15 years of age from rural settings of Ajmer, Rajasthan; it was found that nearly 50% of both male and female users belonged to the age strata of 20 - 39 years; with 8.1% of males and 1.3% of females using alcohol daily or several times in a week (34).

Alcohol abuse runs parallel to tobacco abuse and the estimate of this burden was surveyed in a representative sample of the national population, where 471,143 people over the age of 10 years were studied. The prevalence of regular use of smoking tobacco was 16.2%, chewing tobacco was 14.0% and alcohol use was 4.5%. Men were 25.5 times more likely than women to report regular smoking, 3.7

times more likely to regularly chew tobacco, and 9.7 times more likely to regularly use alcohol(35).

In conclusion, individuals from scheduled castes and tribes were more likely to wallow in regular alcohol use as well as chewing and smoking tobacco. A higher rate of consumption was reported from rural areas, among those with no formal education and among those with incomes below the poverty line. The frequent use of both alcohol and tobacco increased significantly with each diminishing income quintile(35).

As we have seen from some of the above mentioned studies, the horrors of adverse social culture of increasing usage of licit and illicit substances has been associated with a progressively decreasing age of initiation of abuse. The most common forms of drug abuse among children and adolescents in India are alcohol and tobacco. Another iniquitous act of child labour is prevalent in India and high prevalence of drug abuse has been reported among them and from street children. Even though initiation of drug abuse occurs during adolescence, seldom does this group approach the available treatment centres (36). In a study of the habits of 146 children and teenagers from a coastal village near Trivandrum, Kerala where fishery is the prime industry, it was perceived that 29%, 2%, and 3% of them were victims to the vices of pan-tobacco-chewing, smoking, and drinking respectively. A positive correlation was observed between the habit pattern and the number of children per family while education correlated negatively (37).

Among the rural women of Telangana region of Andhra Pradesh, alcohol dependence was noted in 4.1% and hazardous drinking in 1%. Psychiatric co-morbidity related to alcohol was seen in 1% of them. Nearly 4.4% of the pregnant women were consuming alcohol but only 0.2% of them went for follow-up (38).

Even though a distressing proportion of alcohol abusers are present in the community, medical help is rarely sought.

2.2.4 DRINKING PATTERN

The usual patterns of consumption as characterized by the impact on health have been classified as hazardous, harmful or not detrimental. The global key patterns of alcohol use have been commonly described as chronic use, daily or near daily use, binge drinking, solitary drinking and drinking in public places. More than half of all alcohol users in India fall into the criterion of hazardous drinking, which is marked by binge drinking and solitary consumption to the point of intoxication, and has led to the emergence of alcoholism as a major public-health problem (31). In the study of four different groups of population, a pattern of chronic use and hard liquor preference was observed. About two-thirds of the study participants had history of using alcohol for greater than 10 years duration and nearly one-third drank at least once in a week(7). In the rural areas, alcohol was used frequently and in heavy amounts, in comparison to infrequent but heavy use in urban areas. The rates of pathological drinking were similar among slum dwellers and rural population, while rates among township people were similar to the urban populace. Therefore, in rural and slum areas, more number of chronic

health problems related to alcohol were noted, whereas intoxication-related problems predominated among the urban and town areas. In transitional areas binge drinking is the practice, the consequence of which are acute health problems (7).

Government statistics exhibit 21% of adult men and around 2% of women to be drinkers. But surprisingly, nearly one fifth of this group (approx. 14 million people) are categorized as dependent drinkers who require “help” (31).

2.2.5 PREFERRED TYPE OF ALCOHOL PATTERN

In India, there is a variety of alcohol available primarily because of the local brew concoction culture. Spirits account for nearly 95% of all the beverages drunk in India. About two thirds of the alcohol consumed in India is unsolicited because it is either illicit local brew or has been smuggled (31). The cultural landscape determines the type of alcohol consumed. From a study in Rajasthan country liquor was preferred by more than 85% of alcohol users; but 77.5% of males and 96.5% of females indulged in less than one quarter of a bottle, and 65.3% of males and 93.6% of females had their drink in their houses (34).

In a community oriented study from six villages in West Bengal the different types of alcohol used were: locally brewed rice beer (handia), palm wine (tadi), distilled country liquor (chullu), and so-called Indian-made foreign liquor (IMFL) (39). Whisky, Brandy, Rum, Vodka and Gin constitute Indian manufactured foreign liquor (IMFL). In Rajasthan, common country liquor involves the illicit home-

brewed, 'Jhaad ki Ranj ki Daaru' which is distilled from raw sugar mixed with the bark and roots of a berry-like ('Ber') bush. By-products from authorized IMFL distilleries, is peddled as 'Desi Madira' or 'Desi Sharaab' in Delhi and Rajasthan. Urrack and Feni, the first and second distillate of fermented Cashew apples, and Feni distilled from the coconut palm are frequently consumed in Goa. All these forms qualify as illicit country liquor (40).

Chemical analyses revealed ethanol concentrations in Daaru to be ranging from 43% (first distillate) to 87% (second distillate). In Goa, the calculated ethanol concentrations were 14.3–26.5%, 25–45.1% and 17.1–38% for Urrak, Cashew Feni and Coconut Feni, respectively. Local brew is stored and marketed in any available bottle, including IMFL (180, 750 ml), mineral water (1 litre) or soft drink (300, 500 ml) bottles (40).

The amount of drink consumed showed variation with respect to cultural background and type of alcohol consumed. A 'peg' was the standard unit of drink for all distilled spirits. In Delhi and Rajasthan, a standard peg qualified as 40 ml, and 80ml is described as a 'Patiala' or 'Burra' (large or double) peg. In rural Rajasthan, the volume of alcohol is measured by a calibrated jar, which was found to be consistent with 38–44ml and 80 ml for regular and large peg respectively. Another measure used for home brewed Daaru, in rural Rajasthan, was two types of glasses (110 ml and 140 ml) which were filled upto 37ml and 45ml respectively and corresponded to the standard 40 ml peg. In Goa, a peg is defined as 60 ml; half or small pegs as 30 ml. It was observed that among people from lower socio-economic backgrounds, the amount of country liquor consumed

ranged from 30 to 250 ml and at local outlets, a peg is estimated as '3 capfuls' (of a 750-ml bottle), colloquially called 'thekas' (40).

2.2.6 BEHAVIOUR PATTERN

In a qualitative study conducted by Nimmagadda et al. among eight alcoholic clients from a South Indian treatment center for alcoholism, it was reflected that alcohol use is symbolic of economic status, caste, a person's karma, a period of turmoil, and gender privilege (41). The views expressed in a study among the rural population of Ajmer with regard to contributing behaviours and attitudes for drinking were 'for pleasure', 'for celebration of an event' and 'status symbol'. The incidence of physical, social and economic adverse outcomes were realized to be significantly higher among alcoholics (34). Of special interest was a particular practice among the local employers to attract Paniyas (scheduled tribe from Kerala) for work by tempting them with alcohol. Enticing with the lure of alcohol has been deep rooted in the historical oppression and social discrimination of India (33).

High risk behaviors were found to be associated with high levels of alcohol intoxication among young men of 18-29 years from low income communities in Greater Mumbai(42).

2.2.7 CONCEPTION OF TASMALC

The state of Tamil Nadu prohibited the use of alcohol, when in 1937; the then chief minister Mr. M. G. Ramachandran passed the Tamil Nadu Prohibition Act,

1937. Since then intermittently the ban on alcohol has been removed depending on the governmental policies. In 1983 the Tamil Nadu State Marketing Corporation (TASMAC) was set-up and retail sale of liquor in the state, was to be run by it and other cooperatives associated with it. However, till 2001, this sector did not receive much acknowledgement. Only after the ordinance in 2001 to amend the Act X of 1937, did the role of TASMAC receive supreme importance. The government argued that liquor dealers formed cartels which would corner the market. They violated the retail price bounds fixed by the government, and provided access to spurious and contraband liquor, which was detrimental to the consumers. The government's outlook was to provide 'bars which ran in an orderly and hygienic manner' for the benefit of the customers. There are about 7000 outlets all over Tamil Nadu with nearly half of them housing a bar and are concerned with the sale of IMFL only. Ironically, the employees of TASMAC retail shops and bars were drafted from the redundant staff of ration shops. During the prohibition period, a drastic improvement was apparently observed in the standard of living among the slum dwellers but a steeper decline occurred when the ban was lifted (43).

2.3 BURDEN OF ALCOHOL CONSUMPTION IN INDIA

Multiple studies have been done in various parts of the country, on different population groups to assess the burden of alcohol in the country. Variations in each subgroup have been witnessed which can be attributed to the multiform cultural background and practices prevalent in this diverse populace. Some of the

relevant available literatures have been elaborated under the following sub-headings to obtain a picturesque view of the alcohol encumbrance in India.

2.3.1 GENERAL POPULATION

A wide range of prevalence has been reported across the nation. It has been found to be as low as 7% in Gujarat, where alcohol is officially prohibited and as high as 75% in Arunachal Pradesh where the use of alcohol is rampant. From most parts of India, alcohol use has been noted to be a male factor with only upto 5% of women consuming it, except in the north-eastern states where a higher proportion of women intake alcohol. As compared to the western countries, where there is unbridled drinking and the per capita alcohol consumption is estimated to be 4l/adult/year; India seems to fare better with the statistic at 2l/adult/year (30).

In a study among the older adult and elderly population in India the prevalence of alcohol use was determined to be 21.5% in the 55–59 years age group, which sharply reduced to 5.7% in the above 85 years age group and the life-time use of alcohol among the former group was 27.5% (44). Socio-demographic distribution of people consuming alcohol showed some specific patterns. The proportion of people consuming spirits was higher among the tribal, rural and lower socio-economic sectors (30). Christians (61.2%) were found to maximally indulge in alcohol usage, with Buddhists (58.6%) showing the second highest proportion and the least rate of usage being reported among Muslims (9.4%). Inadequate education i.e. illiteracy and education upto primary school were indicted to have a high contributory index towards the burden of alcoholism in India (44). From different studies, it has been revealed that in spite of trying to curb the sale of illicit

local brew, its prevalence of consumption seemed to be higher among the lower rungs of society, who comprise a substantial proportion of our population, followed closely by IMFL whereas beer was found to be the least popular drink; probably because of the relative higher cost (30), (44). Whisky seemed to be the most sought after IMFL. Individuals who were classified as hazardous drinkers were found to consume alcohol more than four times/week (44).

2.3.2 BURDEN OF ALCOHOL IN DIFFERENT PARTS OF THE COUNTRY

Assam has the highest number of people involved in the tea industry; hence a study was conducted there to have an idea of attitudes towards alcohol among the individuals involved in agro-industry. The use of alcohol and tobacco was rife among them. The overall consumption prevalence was 59.2% with 69.3% of males and 54% of females using alcohol, which was much more than the observed percentages in the general population. More than half the participants conformed to both the vices of alcoholism and tobacco usage (45).

Goa has been known to have quite a fraction of the population involved in drinking because of the cultural make-up and the lesser excise duty on alcohol. A cross-sectional examination of the community approaching general practitioners was undertaken. Among them, 59% of the men and 19% of the women admitted to indulging in alcohol. Nearly 10% of the subjects were found to have a hazardous pattern of drinking as estimated by an AUDIT score ≥ 8 . The population attributable risk of perpetration of violence among this group was estimated to be 0.36. Thus a detrimental pattern of alcoholism was confirmed in Goa (10).

In a study among 16-49 year age group in Karnataka, the prevalence of alcohol usage was determined to be 38.1% and among them 54.5% were problematic drinkers. Poorer mental status, severe dependence on alcohol increased the high risk behaviour by nearly two to five fold (46).

Among 24 villages in Punjab the calculated prevalence of alcohol use was 58.3% which was much higher as compared to tobacco, opium or cannabis (47).

2.3.3 BURDEN OF ALCOHOL IN THE URBAN POPULATION

From the results of an interview among men >18years in an urban set-up in West Bengal, about two-thirds of the population were currently consuming alcohol, the proportion of alcohol dependents being 14% and those falling under the category of alcohol abusers being 8%. Among those who consumed alcohol alone, more than two-thirds were identified as alcohol dependents, followed by hazardous users, while the rest were non-problematic drinkers. The average age of first drink was 20.8years and as observed in other places, most of the participants admitted to drinking either IMFL or local illicit brew. Nearly two-fifths of the population confessed to drinking in work places and public places (5).

An evaluation of drinking patterns and trends showed similarity among town and urban dwellers. Majority of the users were in the 26-45years age bracket with whisky being the preferred drink among them. Even though beer constituted only 5% of preferred drink, most of them drank strong beer which has 8% alcohol. Only one-fifth of the interviewees reported drinking more than four times per week. The usual places of consumption were liquor-shops, restaurants, bars and pubs (7).

In urban Goa, 13.6% had risky alcohol consumption pattern with one-third of them disclosing episodes of binge drinking monthly or more frequently. Socio-demographic factors like older age, inadequate educational level, lower socio-economic status and marriage separation being associated with excessive use of alcohol. Social problems of high risk sexual behaviour, mental illness, partner violence and acute health problems of alcohol was noticed among heavy consumers (9).

2.3.4 BURDEN OF ALCOHOL IN THE SLUM POPULATION

AUDIT questionnaire was used to screen men from an urban slum area in Vellore, Tamil Nadu. Similar to the pattern observed among the rural population, nearly half of the men were users of alcohol with about one-third of them falling into the category of problem drinkers. Muslims were least likely to use alcohol because of their religious restrictions. Factors influential in being a drinker were people who performed hard manual labour, those who had a mental illness and those who smoked. Initiation of drinking before the legal age of 21 years had a proclivity for becoming hazardous user. The most commonly consumed alcohol was IMFL with a minimum of Rs.100 being spent on a day (48).

In other studies it has been found that about half the urban population give in to the vice of drinking and one-fifth of them have a frequency of use of more than four times in a week (7).

2.3.5 BURDEN OF ALCOHOL IN THE RURAL POPULATION

Among the few studies conducted in the rural population with regard to the burden of the disease, it has been observed that 45% of the rural population yielded to frequent use of alcohol with one-fifth of them being heavy users. Arrack, a local brew seemed to be the preferred drink among them (7).

It has been mentioned that in the rural population of Goa the high risk drinking pattern was seen in 16.8% of the people with about one-third of them consuming alcohol in hazardous proportions. The frequency of binge drinking was weekly or more often. Poorer living standard and lower educational status was associated excessive alcohol use. Domestic violence was more frequent among problem drinkers (9).

2.3.6 ALCOHOL CONSUMPTION BEHAVIOUR AMONG SCHOOL STUDENTS

With the trend of decreasing age of initiation of alcohol use, it is imperative to assess the nature, attitude and prevalence of drinking among school children. The north-eastern states have consistently reported a higher proportion of drug abuse because of which a study was conducted among 13-15year aged students from those eight states. Alcohol and tobacco use prevalence in these students ranged from 6.9% to 13.1%. Cultural practice of consuming rice beer within the family (inclusive of the children) and social acceptance of drinking norm promoted a greater section of students indulging in alcohol (49).

Not much difference to the above results was recorded among students from a rural and urban setting in West Bengal was noted. A male predominance was associated to the vices with the prevalence of smoking being 8.6% and 11.04%,

and the prevalence of alcohol use being 7.37% and 5.23% among the rural and urban students respectively (50).

2.3.7 ALCOHOL CONSUMPTION BEHAVIOUR AMONG COLLEGE STUDENTS

College students are more prone to start consuming alcohol, because of the lack of restrictions and newly obtained freedom, which has been exhibited in the following studies. In a prospective study among medical students from different medical colleges of North India, it was indicated that two-fifths of them suffered from problem drinking pattern and nearly three-fifths had used alcohol. More than two-thirds of the students started consuming alcohol after coming to college and 6.09% had alcohol dependence. The major contributing factors that emerged were depression and cultural practice of alcohol use among family members (51).

The observed prevalence of liquor consumption among students from 35 colleges from Ludhiana, Punjab was 31.9% with half of the men and 5.2% of women using alcohol. Nearly two-thirds of them drank without the awareness of their parents. The average age at onset of alcohol use was 18.7years among men, while most of the women started consuming alcohol after coming to college. Peer pressure was found to encourage 38.8% to become alcohol user. The other reasons quoted for initiation of alcohol were “curiosity, for fun, for celebrations and during depressed mood” among both men and women. As against other population groups, beer was the most preferred type of alcohol followed by whisky, wine, rum, vodka and gin. The usual place of consumption was either hostel or bar or friend’s home with most of them drinking with their peers. One quarter of the

students reported binge drinking of which nearly one-fifth confessed bingeing more than three times a month. Peer factors played an important role in having a positive attitude towards drinking – “happier and felt good to be a part of gathering, helps to enjoy more, remove strain and able to take their mind off from their personal problems, relaxed, felt easier to open up with people and approach opposite sex”. High risk behaviours like driving after drinking, missing classes and having unprotected sex was on the rise (52).

2.3.8 ALCOHOL CONSUMPTION BEHAVIOUR AMONG PATIENTS

On a regular practice basis among doctors, it is very difficult to assess the drinking status of their patients. When CAGE questionnaire was administered among in-patients of medical and surgical wards of a general hospital, nearly one quarter of them turned out to be problem drinkers with more numbers in the medical wards (53). Hence, it is of prime importance that a quick assessment of alcohol use status be done on all patients, so as to help in reducing the burden of alcoholism.

2.3.9 NATURE, ATTITUDE AND BEHAVIOUR TOWARDS ALCOHOL USE AMONG CSWs AND THEIR CLIENTS

About two-thirds of men who visited CSWs in Mumbai were under the influence of alcohol and had a high risk of having unprotected sex. Two-thirds of them were prey to STIs or HIV. The prevalence of HIV among these men was estimated to be 14%. Having sex after being under the influence of alcohol had 1.5 odds of protracting either STI or HIV (54).

In a comprehensive comparative study among CSWs from Chirala, Andhra Pradesh and Calicut, Kerala it was disclosed that most of them had either traumatic childhood experiences or were exposed to parents who severely consumed alcohol. Majority of them consumed alcohol as a consequence of the nature of their work or were compelled by their clients. Most of the clients preferred to use alcohol before a sexual encounter. The usual preference was for beer and IMFL with few of them using local brew also. There was a high level of psychological stress, sexual violence and harassment by police encountered among the CSWs (55).

In Mumbai, among HIV-infected FSWs, more than one-tenth were alcohol dependent while the proportion of alcohol dependents among HIV-infected male clients was nearly one-third (56). This clearly points out that alcoholism has a predisposition towards high risk behaviour.

2.4 FACTORS RELATED TO ALCOHOL CONSUMPTION

2.4.1 SOCIO-DEMOGRAPHIC FACTORS

The influences of some of the socio-demographic variables have shown to be outcome modifiers of alcoholism. Illiteracy or education only upto primary school level, lower occupational status, marital status, lower socio-economic status, tribal or backward caste, inadequate income, religion, disintegration of joint families into nuclear families, family size and structure have been found to be positive predictors of alcoholism leading to detrimental outcomes (32), (45), (57), (58), (59), (60).

The practice of alcohol consumption by family members and poor family support coupled with the lack of restriction of increased availability of alcohol has led to a decrease in the age of initiation of alcohol use (8), (57), (60). In a study done by Johnson et al. the average age of initiation of drinking was found to be 21.39 \pm 5.34 years, age of problem-drinking was 24.28 \pm 5.42 years, and age alcohol dependence was 27.8 \pm 5.7 years (8).

2.4.2 CULTURAL FACTORS

Cultural traditions, attitudes and values have undergone a sea over the past couple of decades. Traditional joint family structure has broken down, restraints by cultural practices and religious beliefs have been diluted and emergence of a nouveau riche class of individuals has led to a deleterious pattern of alcohol in the general population. Sections of society which did not indulge in drinking have now changed (32).

Improved transportation and communication services, development and industrialization, increased and easy accessibility to alcohol has contributed to escalation of alcohol use among the rural population (39).

Relaxation of parental control, approval of tasting alcohol by parents, parental consumption of alcohol, peer pressure and drinking among friend groups have contributed to early age of beginning of alcohol usage with the average age of first drink dropping to below 19years over the past two decades (31), (61), (58).

In a study conducted in Oslo, Norway, the effect of acculturation of different foreign nationals on the resident national students and vice-versa was established to have a direct influence on the pattern of drinking(62).

Use of tobacco has been determined to be positively correlated with the attitude of alcohol use and the risk was paramount among heavy smokers. This also led this group of individuals to have a higher propensity to develop oropharyngeal carcinomas (63).

2.4.3 PERSONALITY TRAITS

It has been known that individuals suffering from personality disorders have a higher propensity to substance abuse. It has been ascertained that in children, “neurobehavioural disinhibition” described as deviations in affect, behaviour and cognition measure tend to abuse drugs when they grow up. Personality traits of impulsiveness, adventurous behaviour, sensation seeking, inappropriate conduct and high addiction inclination have been reported to have an increased risk for developing alcohol dependence and problem drinking (64), (65). Two types of personality disorders have been described which tend to increase the vulnerability to alcohol addiction. Type I alcoholism relates to late onset, awareness of and sensitiveness to social and environmental issues and behaviours. Type II alcoholism relates to early age of onset, predisposition for antisocial behaviour and have strong genetic vulnerability for addiction (65). Family attitudes have been found to be influential in modifying the above characteristics (64), (65).

Among the above characteristics sensation seeking nature had the most predictable outcome towards not only alcoholism but also towards risky sexual

behaviour. They have a high propensity for early age at drink and alcohol dependence. Violence and aggressive attitude were the other characteristics noted in them (66), (67).

Among school students inducted in a study in West Bengal, curious nature and a mode of enjoyment were deemed to be implicating factors for alcohol use. Parental attitudes were also influential in these students for accommodating a positive attitude for alcohol (50).

Among MSWs from Chennai, who consented to be interviewed for behavioural and psychosocial assessment, two sub-groups were identified viz. Panthi (active partner) and Kothi (passive partner). Panthis were found to be older in age, more masculine and aggressive with proneness for being intoxicated or drinking in heavy amounts as compared to the Kothis who had contrary characteristics(68).

2.4.4 PEER FACTOR

As discussed earlier, peer influence and pressure has direct influence on the attitude towards alcoholism. Approval by friends, encouragement to drink and alcohol use by friends has been found to have a strong positive correlation with indulging in drinking (61). On the socio-developmental front, alcohol seems to have a negative effect. This behavioural change has been incremental over time. Family acceptance and consumption by family members, coupled with peer influence has an additive effect on the outcome of alcohol use by an individual. As a consequence of this, emergence of chronic alcoholic and alcohol dependent patterns has occurred. Indirect negative effects are being experienced in the well-being of the society (7).

In a study in England among the foreign nationals of India, China and Pakistan, high levels of consumption of alcohol was documented. The significant markers for this witnessed behaviour were acculturation and influence by peers of other communities and by friends who drank alcohol from the same community (69).

Even in the medical community in eastern part of Nepal, drinking seemed to be prevalent with nearly nine-tenths admitting to alcohol use for more than ten years duration. The reasons quoted by them for giving in to alcohol were “peer pressure” and “to become a social human being”. Alcohol was mostly consumed during parties or in gatherings at home (70).

2.4.5 GENETIC FACTOR

Amongst Japanese with inherited deficiency of acetaldehyde dehydrogenase type I (ALDH-I), only 4% were diagnosed to be alcoholics. The reason attributed to this observation was the onset of “flushing syndrome” which prevents individuals from becoming habitual drinkers and alcohol dependents (71).

2.4.6 MEDIA EXPOSURE

India has a vast cinematic variety both at the regional level and the national level. Uncountable movies are produced in India every year with a significant proportion of them depicting the use of alcohol. Irrespective of the character, i.e. hero/heroine/villain; irrespective of the situation, the mood and the type of movie or TV show, alcohol has been glamorized in every possible situation. In our country actors are put on a pedestal and fans try to impersonate them, which indirectly contributes to the burden of alcoholism. Because advertising has been

shown to directly influence the use of alcohol, it has been banned; but surrogate media exposures are utilized (72). In a longitudinal cohort study of 13,000 participants who were recruited at 10years of age and followed upto 26years, a definitive detrimental effect of alcohol use was established after exposure to media promotion and alcohol advertisement (73).

2.4.7 AVAILABILITY FACTOR

Even though prohibition of alcohol use has been mentioned in the Constitution of India, nearly every state's coffer receives revenue from production and sale of liquor. In some states, excise duty from alcohol account for nearly a quarter of the total budget. Hence, curbing of sales is near to impossible and alcohol is made freely available. Unlike foreign countries, there is no strict regulation and restriction of sale to minors. Implementation of high taxes in some places have resulted in the budding of moonshine markets and making the sale of illicit liquor more frequent. On the other hand, low taxation leads to affordability of industry manufactured alcohol, thereby, again increase the burden of alcoholism. Extreme difficulty is faced in trying to gain respite from this vice (32).

In the urban population the easy accessibility and availability of alcohol have compounded the occurrence of high risk sexual behaviour among vulnerable groups (74).

2.4.8 PROTECTIVE FACTORS

In the GENACIS project (Gender, Alcohol and Culture: an International Study) where 18 countries from the WHO Regions were surveyed, the effect of social

and family pressure to drink less on the outcome of problem drinking and seeking help for alcoholism was evaluated. It was observed that in countries where the social control efforts were high, the average level of alcohol consumption was low (75). Most commonly pressure to decrease alcohol consumption was exerted by the spouse followed by other family members. The pattern of social restriction was more prevalent in the middle and low economic countries, primarily because of the financial burden within communities. Men experienced more restrictive advice as compared to women probably because of higher incidence of problem drinking in them (76).

A study in Netherlands found that alcoholism was less prevalent among children whose parents were strict, well educated and do not use alcohol. These parents were more receptive to governmental control policies and predicted to decrease the burden of alcoholism (77).

In a comparative study among medical students from India and Malaysia, the knowledge and awareness regarding the negative effects of alcohol consumption were high which prompted them to have a negative reinforcement attitude towards alcohol use (21). Daniel Regan et al. studied the attitude towards non-drinkers among adolescents going to college in Ireland and concluded that a negative attitude towards non-drinkers was observed among the drinkers, whereas a positive attitude towards non-drinkers was associated with lesser proportion of adolescents using alcohol (18).

In another study among adolescents from Cardiff, participation in organized sports and team sports was found to decrease the incidence of alcohol use, but participation was dependent on the introvert/extrovert behaviour (78).

2.5 ASSESSMENT OF ALCOHOL USE

There are many forms of excessive drinking that cause substantial risk or harm to the individual. They include high level drinking each day, repeated episodes of drinking to intoxication, drinking that is actually causing physical or mental harm, and drinking that has resulted in the person becoming dependent or addicted to alcohol. Excessive drinking causes multiple social problems and immense economic losses. AUDIT was developed to screen for excessive drinking and in particular to help practitioners identify people who would benefit from reducing or easing drinking. The majority of excessive drinkers are undiagnosed. The AUDIT questionnaire will help the practitioner identify whether the person has hazardous (or risky) drinking, harmful drinking, or alcohol dependence. Hazardous drinking is a pattern of alcohol consumption that increases the risk of harmful consequences for the user or others. Harmful use refers to alcohol consumption which results in consequences to physical and mental health. Alcohol dependence is a cluster of behavioural, cognitive and physiological phenomena that may develop after repeated alcohol use. Typically, these phenomena include a strong desire to consume alcohol, impaired control over its use, persistent drinking despite harmful consequences, a higher priority given to drinking than to other activities

and obligations, increased alcohol tolerance, and a physical withdrawal reaction when alcohol use is discontinued (79).

The established haematological and biochemical markers of alcohol intake are gamma-glutamyltransferase activity, aspartate aminotransferase activity, erythrocyte mean corpuscular volume, carbohydrate-deficient transferrin, total serum sialic acid and sialic acid index of Apolipoprotein J, beta-hexosaminidase, acetaldehyde adducts and the urinary ratio of serotonin metabolites, 5-hydroxytryptophol and 5-hydroxyindoleacetic acid (80).

The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) was developed for the World Health Organization (WHO) by an international group of substance abuse researchers to detect psychoactive substance use and related problems in primary care patients (81).

To measure and quantify the amount of drink consumed, a new Fractional Graduated Frequencies (F-GF) and quantity-frequency (QF) scale was developed by researchers from GOA, which had a good correlation with the AUDIT scale and was found to be a better predictor of high risk events (82).

2.6 PROBLEMS OF DRINKING

The problems encountered with drinking are multifaceted and have been described under the following overheads:

2.6.1 PHYSIOLOGICAL

It is known that alcohol acts as a neurodepressant and its action is manifested by altering the balance between excitatory and inhibitory neurotransmitters. An initial

euphoria is experienced but later more serious psychological manifestations occur, even as much so, memory alternation can occur (83). Diminishing of response to stimuli and reaction to an event has been established to be a consequence of alcoholism. Alcoholics seemed to fare poorly in the Trail Making test and Stroop tests, which corroborates with the sequelae of the above mentioned physiological effects (84). Chronic alcohol affects the peripheral nerves causing hyperalgesia, burning sensation and allodynia. Abstinence from alcohol and supplementation with B-complex vitamins has been found to have some benefit (85).

A more ruinous effect of alcohol is sexual dysfunction, which is more prominent in males. The common problems associated with alcoholism are low sexual drive, premature ejaculation, erectile dysfunction, hormonal imbalance and semen quality and quantity inadequacy. These problems have a high incidence among alcoholics with an estimated approximate of two-thirds of alcoholics. The quantum of drinking is directly proportionate to the onset of any or all of the above mentioned detrimental effects (86), (87), (88).

The cheaply available country liquor, most often contains methanol and can result in blindness (59). Chronic alcohol use also affects the audio-vestibular parameters causing decreased hearing and vertigo (89).

In a study conducted in the rural population, alcohol was found to be associated with not only hypertension but also with coronary heart disease (90), (91). Alcohol use has been shown to have a detrimental effect on the blood supply to the heart, heart rate and beat variability and can trigger off myocardial infarction (92), (93).

Initially it was believed that moderate amounts of alcohol may have a cardio-protective effect, but results among CHD patients and general population proved to be contrary and can even cause heart failure and death (94), (95), (91).

Even though moderate amount of alcohol consumption has shown to increase the level of high density lipoprotein fraction of cholesterol, the fraction of the harmful lipids also increase, thereby outweighing the benefit (96), (97), (95), (91).

Chronic alcohol abuse has been implicated in worsening systemic and local oxidative stress which is causes injury to lung tissue (98).

Animal experiments have shown that maternal alcohol use causes increased levels of glucose which incorporates into the spinal cord membrane layer, thereby disrupting the fluidization process (99). The most harmful effect of alcohol use during pregnancy is the onset of Foetal Alcohol Syndrome(FAS), for which there is no definitive cure (100).

Alcohol has been found to alter the balance between the oxidant and anti-oxidant enzymes within the body leading to adverse effects which in turn affects the toxicological profile of blood and decreases immunity (101). Production of adhesion molecules as a result of alcohol use has been indicted in the development of hepatic injury (102).

Alcohol has been noted to affect the bone mineral density especially of the long bones and the vertebrae. The result of hormonal imbalance because of alcohol use is responsible for the change in the bone mineral density (103). A study

among rats has shown that the breaking threshold for long bones is markedly reduced when alcohol is abused (104).

India is the Diabetes capital, and the use of alcohol has become quite rampant in this country. Diabetes, by itself can precipitate multi-organ failure. The adverse effects of diabetes get coupled with the use of alcohol. Blood sugar levels become difficult to control and a significant amount of weight loss is observed among alcoholic diabetics (105). Liver enzymes get deranged, the glucose store in the liver is affected and an oxidative stress is induced upon the liver cells, leading to impairment of liver functions and ultimately leading to liver cell failure. A similar detrimental effect is noticed in the kidney. Hence, drinking coupled with diabetes is a high risk attribute which needs timely intervention (106).

Binge drinking and alcohol induced coma causes rhabdomyolysis which affects the kidney by causing acute tubular necrosis and an acute renal failure(107).

Alcohol has been implicated as a causative agent in oral cavity, pharyngeal, laryngeal, oesophageal and hepatobiliary carcinomas (108), (109), (110), (111), (112), (113). Chronic alcohol use has been found to be responsible for causing alcoholic cirrhosis and both acute and chronic pancreatitis (114). Incidence of amoebic liver abscess has been found to be higher among alcoholics, probably because of faulty iron metabolism (115).

2.6.2 PSYCHOLOGICAL

Studies done in India and in western countries have shown that alcoholics suffer from a variety of psychological effects ranging from depression to anxiety.

Hysteria and psychopathic deviant behaviour have been found to be significantly associated with alcoholism (116), (117), (118).

Maternal use of alcohol in pregnancy leads to fetal alcohol spectrum disorder (FASD) which is characterized by typical facial features, growth retardation, intellectual dysfunction and behavioral problems which manifest at an early age and progress to adulthood. Alcohol is neurotoxic to the brain during the developmental stage (119).

Parental consumption of alcohol, leads to children having behavioral and cognitive problems. Children of men with alcohol dependence had poor neurodevelopment and had lower scores on the performance scale. The family environment of children of men with alcohol dependence was characterized by lack of independence for its members, greater perceived control and lack of adequate cultural and intellectual activities (120).

2.6.3 SOCIAL

Problem drinking has been reported to cause social disturbances, family discord, domestic violence, childhood exposure to alcohol and frustration, forced unprotected sex and having more sexual partners (31), (39), (121), (122), (123), (124).

Employers in poor, marginalized communities sometimes pay wages in alcohol rather than cash, according to WHO. There is evidence even to suggest that the poor are beginning to drink more than they earn—a deadly spiral of alcohol and debt (31).

2.6.4 PUBLIC HEALTH

Alcohol's adverse public health impact includes diseases like HIV infection and tuberculosis, injury, violence, deliberate self-harm, disability, marital and social problems including financial debt, psychiatric illness, drunk driving and road traffic injuries and fatalities, drug use, high-risk sexual behaviour, unsafe sex and STIs, and premature death (25), (30), (31), (32), (64), (125), (126), (127). Harmful use of alcohol results in loss of productivity, income and trained manpower. The effects of alcohol aggravate the causes of poverty (e.g. by increasing malnutrition, absenteeism at work, road traffic accidents and loss of productivity) (31), (32), (64).

The implication of economic burden of alcoholism was studied by assessing the levels of borrowing and distress selling of assets to meet hospitalization costs. The population attributable risk was assessed to be 16%, which suggests that there is an association between use of tobacco and alcohol, and impoverishment through borrowing and distress selling of assets due to costs of hospitalization (31), (128).

Tobacco and alcohol have frequently been concurrently used and their ill-effects are synergistic. The outcome of this combination was an observed increase in the risk of mortality and incidence of chronic diseases including cancers (32), (129).

The NFHS-II of India, showed a significant association between household tobacco and alcohol use, and child health. Children were found to be at an increased risk for unimmunization, acute respiratory tract infections, malnourishment and infant mortality (130).

In a study conducted by the Tuberculosis Research Centre (TRC), Chennai, Alcohol Use Disorders (AUDs) among tuberculosis patients were associated with non-adherence and poor treatment outcomes leading to a high incidence of severe forms of TB and mortality (131).

2.7 ECONOMIC IMPLICATIONS

The economics of alcohol is measured by the impact of reduced alcohol consumption on employment, alcohol taxation policies and cost burden of alcohol related problems. Studies in different parts of Europe have revealed that there is a dearth of people in agricultural and related fields; hence, cutting down the production would not adversely affect the livelihood of individuals. In fact, a study done in Italy showed that even when production and consumption of alcohol decreased, the employment in the hotel and food sector went up. Thus, curtailing the production of alcohol and its sale in retail outlets would not alter the economics of unemployment, as alternate professions can be sought. Alcohol taxation policies are governed by the interests of political parties and the political scenario. If the price of alcohol is increased, it indirectly curbs the proportion of people using alcohol and even reduces the prevalence of alcoholism. On the flip side, it promotes production and procurement of illicit brew. Therefore alcohol related policies should encompass all kinds of alcoholic beverages and preference should be given to cost-effective intervention, so that the community at large may be benefitted. The direct and indirect costs incurred due to alcoholism is massive and includes costs for treating alcohol-related problems, costs for the sick insurance system, costs of the social welfare and criminal justice system and

costs of lost production due to absenteeism and lowered working capacity. There are many problems in making these estimates, including the problems of estimating the value of lost production, estimating the value of lost life and estimating the marginal costs of treatment. Thus, estimates of the societal costs should only be used as illustrations of the magnitude of the costs, and not as accurate calculations. A proposed strategy has been to increase the taxation of alcohol and use the revenue for treatment of alcohol related medical and non-medical costs, thereby ensuring alcohol users indirectly pay for the outcomes of the practices (132).

2.8 TACKLING THE PROBLEM

Policy makers should try to influence parents' opinions on the consequences of alcohol consumption, as well as the norm of not consuming alcohol before 16 years of age, which can lead to increased parental support. Factual knowledge does not influence support, so information campaigns alone do not increase parental support (77).

It has been difficult to implement alcohol prohibition policies in India, even though the Constitution accommodates for it, primarily because of political party influence and interests (31). Under the National Drug De-addiction Programme, the Government of India has funded 483 detoxification and 90 counseling centres which deal with alcohol dependence. Most of the focus of treatment is directed towards acute adverse events of alcoholism, rather than its prevention (31). There is an imperative need to develop a comprehensive alcohol policy in India which should encompass control of supply of alcoholic beverages through statute and

regulation; modifying drinking practices directly; and reducing the physical and social environmental risks (133). While making policies, particular heed should be paid to transitional and under-privileged population groups (7).

From a study done in India, a culture specific two-session brief intervention for harmful alcohol use is an effective intervention and leads to improvement in the outcome in the short-term. The use of both brief intervention and simple advice has been shown to be effective tools for motivation enhancement in the short term. To obtain a sustained change, booster sessions of these interventions is imperative (134), (135). In a study conducted in Mumbai, India; street play and theatrical was used as an effective intervention for bringing about awareness and prevention of the ill-effects of alcoholism (136).

College student drinking may be influenced by environmental factors on and off campus. The environmental strategies that have been identified to improve the situation are: increasing compliance with minimum legal drinking age laws, reducing consumption and risky alcohol use, decreasing specific types of alcohol-related problems and de-emphasizing the role of alcohol on campus and promoting academics and citizenship (137).

Different countries have tried out various models and policies to curb the occurrence of alcoholism, some of which are: setting up senior citizens programs, minority employment programs, English enhancement training for the foreign-born, comprehensive and stringent alcohol control policies, guidelines and control of sale of alcohol to the under-aged. Few of these policies have been successful and have gained popularity (25), (138), (139), (140). In addition to continued

research on the effectiveness of alcohol control policies, research is also needed to determine how best to implement strategies that differ markedly in cost, cultural acceptability, political challenges and population reach. More stringent measures to protect young people from exposure to irresponsible advertising need to be considered as self-regulation codes that are not easily circumvented and enforceable (140). The alcohol industry has been instrumental in non-development of prohibition policies as they do not favour the regulatory approaches but consent to educational approaches only. From the various studies done, it has been implied that it is high time that the alcohol industry is kept at bay while making policy decisions which would benefit the community at large (141).

The adverse influence of alcohol on TB has resulted in default, non-compliance, severe forms of TB and early death. A focus group discussion with TB patients has revealed that peer pressure compels them to drink. Therefore, the need for alcohol intervention program among TB patients, their care-givers and health personnel is overwhelming (142).

In a study conducted in Vellore, where a cohort of patients were followed up, interventional strategy model of detoxification and de-addiction similar to 'Alcoholics Anonymous' was found to be efficient in maintaining sobriety during a 5 year follow-up period (143).

In a community based rehabilitation intervention versus hospital based intervention conducted in Bangalore, better results were obtained with community and individual intervention on long course follow-up. Follow-up support and

continued care appeared to significantly improve longer-term recovery and abstinence in alcohol dependents (144).

A study on different approaches to maintain de-addiction showed that individual relapse prevention, dyadic relapse prevention and treatment as usual were effective with the most promising results being shown by dyadic relapse prevention. Family based intervention has also been found to be helpful(60).

Pharmacological management of alcohol deaddiction can be managed with acamprosate, disulfiram, topiramate and naltrexone, of which disulfiram has been found to be the most effective (145), (146), (147).

In the Eighth plenary meeting (21 May 2010), WHO's Sixty-third World Health Assembly, an allegiance was undertaken to combat the problem of alcoholism. All the member States were urged to develop alcohol prevention and prohibition policies and the World Health Assembly endorsed and affirmed the development of a global strategy with inter-sectoral co-ordination. The Director General was endowed with the responsibility to facilitate and monitor progress of the same (148).

3 OBJECTIVES

- i. To assess the prevalence and patterns of alcohol consumption amongst 20 – 35 year old males in a rural community in South India.

- ii. To identify the factors associated with problem drinking amongst 20 – 35 year old males in a rural community in South India.

4 METHODOLOGY

4.1 STUDY SETTING

The study was carried out in K.V Kuppam rural development Block, Vellore district, Tamil Nadu, the service area of RUHSA Department, Christian Medical College, Vellore. The K.V Kuppam Block is one of the 20 government administrative blocks that make up the Vellore administrative district in Tamil Nadu and there are 39 panchayats and 89 revenue villages within the block. The total population of K.V Kuppam block is 128,033. Majority of the block residents follow Hindu religion and about 3% belongs to other religions including Muslims and Christians. Most of the inhabitants in the block live on agriculture and linked occupations. There is a recent trend among young men in the rural areas to migrate to the nearby urban towns and cities to work as labourers or get into alternate professions. Some of the other occupations are weaving, running poultry farms, dairy industry and “Beedi” (country cigarettes) making.

4.2 PERIOD OF RECRUITMENT

January to August 2014

4.3 STUDY DESIGN

A cross-sectional survey was done to measure the prevalence of alcohol use among males between 20 and 35 year age group residing in K.V Kuppam block. A case control study approach analysis was used to determine the risk factors for problem drinking.

4.4 INCLUSION AND EXCLUSION CRITERIA

- Prevalence study :
 - Inclusion criteria
 - Males
 - Age group 20 – 35 years
 - Individuals who give informed consent to participate in the study
 - Exclusion criteria
 - Any individual with history of mental illness

- Case control study approach for analysis of risk factors :
 - Cases: problem drinkers as defined by AUDIT Questionnaire with a score of more than and equal to 8.
 - Controls : individuals who are non-problem drinkers and non-drinkers.

4.5 SAMPLE SIZE CALCULATION

PREVALENCE STUDY

From various studies done in India (5-10,12,13,30,45-47), the estimated prevalence (P) of alcohol use in this community was considered to be 40%. The precision (d) of the study was fixed at 20%. To account for inter-cluster and intra-cluster variability of alcohol use among participants, the design effect was taken

as 2. The calculated sample size (N) for assessing the prevalence of alcohol use in this rural population was 300.

Sample size calculation:

$$N = \frac{4 \times P \times Q}{d^2} \times \text{design effect}$$

$$N = \frac{4 \times 40 \times 60}{8^2} \times 2$$

$$N = 300$$

CASE CONTROL STUDY APPROACH FOR RISK FACTOR ANALYSIS

Based on a previous study done (Khosla V et al.) (52), with nearly 30% of the young alcohol consumers being reported to be influenced by peer pressure (p_0) and an anticipated odds (OR) for exposure to peer pressure among problem drinkers to be 3, the minimum number of cases (n) required to have 80% power to detect a difference between two proportions, with a 0.05 two-sided significance level, was calculated to be 56.

p_1 Was calculated using the formula:

$$p_1 = \frac{OR \times p_0}{(1 + p_0(OR - 1))}$$

$$p_1 = \frac{3 \times 0.3}{(1 + 0.3(3 - 1))}$$

$$p_1 = 0.56 \quad p_0 = 0.3$$

$$\text{Average proportion exposed (P)} = \frac{(p1 + p0)}{2}$$

$$= 0.43$$

$$\text{Proportion unexposed (Q)} = 1 - P$$

$$= 1 - 0.43$$

$$= 0.57$$

Sample size was calculated

$$n = \frac{2 \times PQ(Z_{\alpha} + Z_{\beta})^2}{(p1 - p0)^2}$$

$$\alpha = 0.05 ; Z_{\alpha} = 1.96$$

$$\beta = 0.20 ; Z_{\beta} = 0.84$$

$$n = \frac{2 \times 0.43 \times 0.57(1.96 + 0.84)^2}{(0.56 - 0.30)^2}$$

$$n = 56$$

Since 50% of the alcohol users are estimated to be problem drinkers, the expected number of problem drinkers in this study is 60, which is in excess of the minimum number of required cases for risk factor analysis.

4.6 SELECTION OF PARTICIPANTS

CLUSTER SAMPLING TECHNIQUE

The participants were selected using 2 stage cluster sampling technique. In the first stage, village was taken as a cluster and from the 89 villages, 30 clusters were chosen using probability proportionate to size. In the 2nd stage, a list of all the young male adults in the age group of 20-35 years in all the 30 clusters was made using the existing RUHSA department census data and from each cluster 10 eligible participants were selected using systematic random sampling technique.

PARTICIPANT SELECTION FOR CASE CONTROL APPROACH OF RISK FACTOR ANALYSIS

All participants who scored 8 or more in the AUDIT questionnaire were termed as problem drinkers and were taken as cases. People who did not consume alcohol were termed as non-drinkers. Those who consumed alcohol but had an AUDIT score less than 8 were termed as non-problem drinkers. Non-drinkers and non-problem drinkers were taken as controls.

4.7 DEVELOPMENT OF DATA MEASUREMENT TOOL

A structured questionnaire was developed including the 10 item AUDIT questionnaire, socio-demographic characteristics, ICMR socio-economic assessment scale, alcohol related information including the age of initiation, type of alcohol consumed and place of consumption; and risk factors for problem drinking including parental and family member use of alcohol, consumption by friends, peer pressure and influence, non-participation in activities and the Regan

Attitudes toward Non-Drinkers Scale(RANDS). After selecting the participants, this questionnaire was administered to them by a door to door survey. Consent was obtained prior to the implementation of the questionnaire.

QUANTITATIVE VARIABLES

The outcome of alcohol use was categorised as problem drinkers, non-problem drinkers and non-drinkers using AUDIT questionnaire

Risk factors assessed for problem drinking

- Age
- Socio-Economic Status
- Level of education
- Caste
- Employment status
- Occupational class
- Early Life Family structure
- Parent / family member consuming alcohol
- Friends consuming alcohol
- Involvement in extracurricular activities
- Peer pressure measured by 2 items :
 - Attitude : feeling of being left out when friends were drinking; friends making fun if the participant refused to drink alcohol when offered; feeling of popularity after consuming alcohol
 - Peer influence : consumption of alcohol by friends; friends encouraging to drink

- Opinion about reasons for alcohol consumption: The following choices were given
 - Mode of entertainment
 - For relaxation and time pass
 - For socializing with friends
 - Family tension and problems
 - Work related stress
 - Poor performance in school or work place
 - Death of loved ones
 - Presence of chronic illness/debilitating condition
 - Social norm
- Attitudes toward non-drinkers (RAND Scale)

MEASUREMENT OF VARIABLES

- **Age** was measured in years.
- **Socio-Economic Status** was assessed using ICMR SES scale. The scale has 7 domains which are house profile, material possession profile, educational profile, occupational profile, economic profile, land possession cost profile and social profile. House profile took into account the type of house in which the participant resided and the amount of constructed and unconstructed land owned by him. The type of house was assessed by the type of roof which could be either a hutment roof or an asbestos/tin shed or a reinforced brick roof with/without plaster or a reinforced cement concrete roof

with/without plaster. Material possession profile made allowances for available household gadgets according to the cost of the items and conveyance facility according to the cost of the vehicle. Educational profile was an average of the calculated weighted average of the educational qualification and the computer proficiency of the family members greater than 18years. Occupational profile was calculated as an average of weighted classes of occupation among the family members involved in monetarily gainful activity. Economic profile took into consideration the average per capita income. The presumptive cost of owned land was assessed in the land possession cost profile. Social profile evaluated the understanding and participation in social issues and activities. The scores of each domain were added to obtain the SES score, which was then classified into five categories of lower class, lower middle class, middle class, upper middle class and upper class.

- **Caste** was categorized as forward, backward, most backward, scheduled caste and scheduled tribe.
- **Education** was assessed by nil, primary, secondary, graduation/diploma, post-graduation/professional degree and higher studies.
- **Employment status** was categorized into people who were either employed, or had their own business or were unemployed or were students.
- **Occupational status** was classified as CLASS-I which included executives/senior professionals (experience more than 5 years), university/degree colleges teachers, principals of degree colleges, professors, farmers (land more than 20 acre), businessman (goods >Rs.10,00,000.00), leaders like MP's; CLASS-II which included junior professionals (experience

up-to 5 years), intermediate teacher, principals upto intermediate colleges, farmer (cultivated land up to 10-20 acres), business man (goods up to Rs.1,00,000.00 - 10,00,000.00), Public leader like M.L.A. etc, Govt. contractor; CLASS-III which included primary school teacher, high school teacher, small businessman (having his/her own or rented shop and goods up to Rs.1,00,000.00), farmer (cultivated land 1- 10 acres) & private contractor, insurance agents, local public leader; CLASS IV which included skilled worker (tailor, black smith, carpenter, washer-man, potter, barber, driver), hawker, small shopkeeper (goods up to Rs.50,000.00), petty farmer (cultivated land <1 acre), caste occupation; UNSKILLED WORKER which included Unskilled labour (labour, agricultural labour, rickshaw puller), street vendor (goods up to Rs. 5000.00) and NO GAINFUL EMPLOYMENT which included people who did not have any source of income.

- **Marital status:** Individuals were classified as either being married, unmarried, divorced/separated or widowers.
- **Family type** was grouped as nuclear, joint and extended.
- **Income:** The monthly income of the participant was calculated under the overheads of salary, agriculture, land and business.
- **Ever use of alcohol** in their life was marked by either a positive or a negative response.
- **Alcohol use in the past year** was assessed by either a positive or a negative response.
- **Place of consumption** was classified as home, friend's home, bar or in other places.

- **Types of alcohol consumed** was grouped under beer, IMFL and country liquor.
- **Amount of expenditure** incurred towards alcohol consumption was quantified in rupees.
- **AUDIT score:** WHO developed AUDIT Scale was used to classify and assess the prevalence of alcohol consumption in the past 1 year. There were 10 questions related to the severity of alcohol consumption with a minimum score of 0 and a maximum score of 4 for each question. Therefore, the minimum and maximum attainable scores were 0 and 40 respectively. Individuals were classified as non-drinkers (AUDIT score = 0), non-problem drinkers (AUDIT score = 1-7) and problem drinkers (AUDIT score \geq 8).
- **Early life family structure** was assessed by the presence of both parents being alive, single parent being alive, orphan being brought up by guardians or a discordant family.
- **Consumption of alcohol by parents or family members** was measured by either a positive or a negative response
- **Peer factor influence** response was either positive or negative
- **Participation in extracurricular activities** was marked by either a positive or a negative response
- **Reasons for alcohol use** was measured by objective answers
- **Regan Attitude towards Non-Drinkers Scale:** There are 11 items in the RANDS questionnaire which have a graded response from “strongly disagree” to “strongly agree” with scores ranging from 5 to 1 respectively. The maximum

and minimum obtainable scores were 55 and 11 respectively. This score was used to assess the attitude towards non-drinkers.

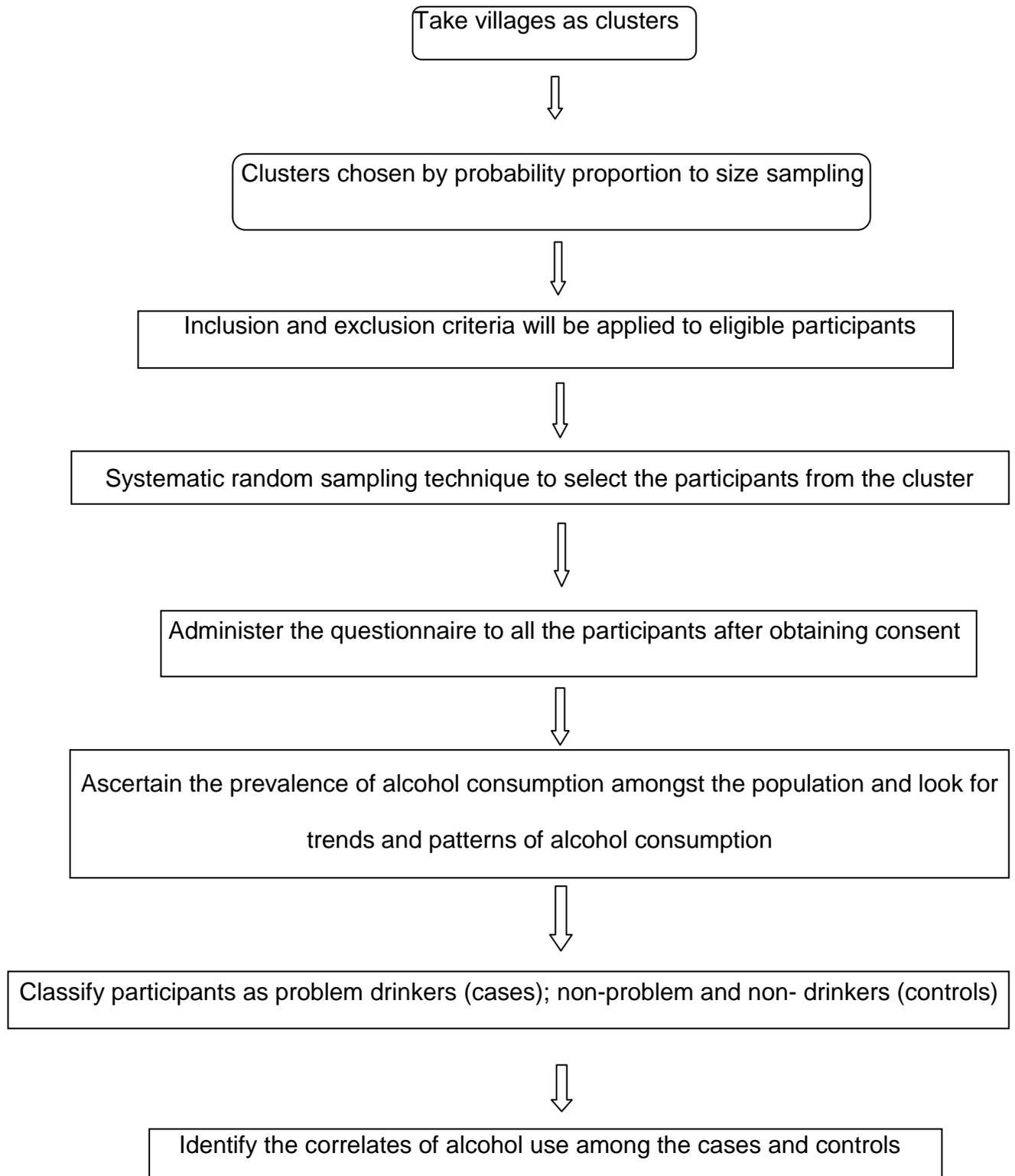
4.8 BIAS

Selection Bias was avoided by selecting participants using random sampling techniques from the recently updated RUHSA census data for prevalence study and cases and controls were selected for risk factor analysis from the sample using objective case and control definition using validated AUDIT questionnaire.

Random misclassification of cases and controls were minimised by using a validated objective AUDIT questionnaire and exposure using objective questions and validated RANDS questionnaire.

Elimination of non-response bias was done by good rapport building, professional introduction, taking the help of existing health workers in the field, formulating questions in a non-threatening manner.

4.9 DETAILED DIAGRAMMATIC ALGORITHM OF THE STUDY



4.10 STATISTICAL ANALYSES

UNIVARIATE ANALYSES

Prevalence of ever use of alcohol, alcohol use in the past 1 year, type of alcohol consumed, preferred place of consumption, age of initiation of alcohol use, frequency of use of alcohol, amount of alcohol consumption, frequency of binge drinking, anti-social behaviour after alcohol use and risk factors in cases and controls were described using marginal percentages, means, standard deviations, median and percentiles.

BIVARIATE ANALYSES

Bivariate Associations between risk factors and problem drinking was assessed using Chi square test for categorical variables, checking the difference between 2 proportions in cases and controls, and t-test for normally distributed continuous variables, checking the difference between 2 means in the 2 groups and strength of association was checked using Odds Ratio.

MULTIVARIATE ANALYSES

Binary Logistic regression analysis was done to assess the independent association between significant risk factors for problem drinking when compared with controls adjusting for confounders. All the potential risk factors identified to have association with problem drinking at less than 20% significance level when bivariate analyses were done, were put in the final models.

5 RESULTS AND ANALYSIS

5.1 PREVALENCE STUDY

5.1.1 SOCIO-DEMOGRAPHIC PROFILE

We surveyed 300 males in the age group 25 to 30years from 30 villages in K.V Kuppam rural developmental Block in Vellore District, Tamil Nadu. The socio-demographic characteristics of the participants have been described in Table 1.

Table 1 : Baseline characteristics (n=300)

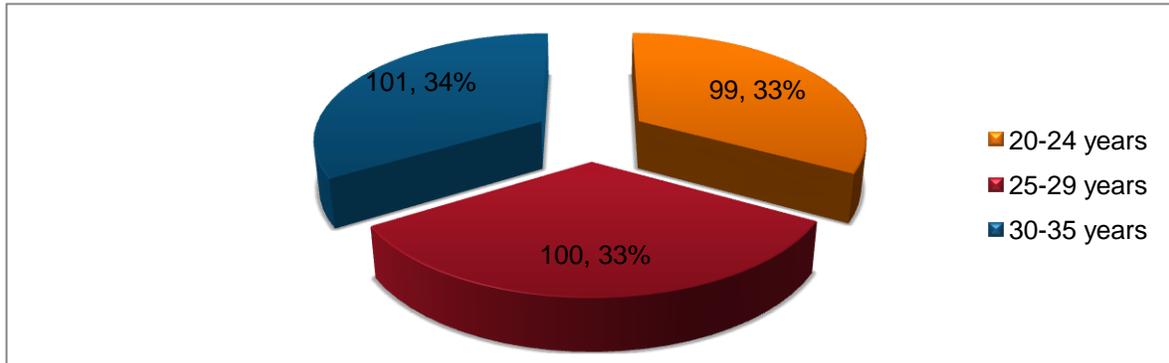
S. No.	Characteristics		Values
1	Age [Mean age (S.D)]		27.10 (4.58)
2	Age categorized [Number (%)]	20-24 years	99 (33.0)
		25-29 years	100 (33.3)
		30-35 years	101 (33.7)
3	Religion [Number (%)]	Christian	11 (3.7)
		Hindu	282 (94.0)
		Muslim	7 (2.3)
4	Caste [Number (%)]	Forward Caste	9 (3.0)
		Backward Caste	102 (34.0)
		Most Backward Caste	96 (32.0)
		Scheduled Caste	93 (31.0)
		Scheduled Tribe	0 (0.0)
5	Marital Status [Number (%)]	Married	122 (40.7)
		Single	178 (59.3)
		Divorced	0 (0.0)
		Separated	0 (0.0)
		Widower	0 (0.0)

S. No.	Characteristics		Values
6	Family Type [Number (%)]	Extended	117 (39.0)
		Joint	4 (1.3)
		Nuclear	179 (59.7)
7	Educational Profile [Number (%)]	No formal education	5 (1.7)
		Up to primary education	75 (25.0)
		Up to secondary education	118 (39.3)
		Up to graduation/diploma	51 (17.0)
		Up to post-graduation /professional degree	51 (17.0)
8	Employment Status [Number (%)]	Employed	247 (82.3)
		Self-Business	21 (7.0)
		Student	26 (8.7)
		Unemployed	6 (2.0)
9	Occupation [Number (%)]	CLASS I	2 (0.7)
		CLASS II	20 (6.7)
		CLASS III	42 (14.0)
		CLASS IV	181 (60.3)
		UNSKILLED	23 (7.3)
		No Gainful Employment	32 (11.0)
10	Income in Rs. (excluding students) (n=274)	Median [25th percentile, 75th percentile]	7000 (4950 , 10000)
		Minimum	0
		Maximum	40,000
		No. of people earning less than minimum wages of Rs. 3000 per month	29 (10.6)
11	Socio-Economic Status [Number (%)]	Lower Class	0 (0.0)
		Lower Middle Class	168 (56.0)
		Middle Class	113 (37.7)
		Upper Middle Class	19 (6.3)
		Upper Class	0 (0.0)

5.1.1.1 AGE DISTRIBUTION

We observe that there was equal distribution of individuals from all ages within the age range of 20 to 35 years with a mean (S.D) age of 27.10 years (4.58).

FIGURE 1: AGE DISTRIBUTION IN THE STUDY POPULATION (N=300)



5.1.1.2 RELIGION AND CASTE CATEGORIZATION

In India, the predominant religion is Hinduism, which was reflected in the study population (94%). It was a noteworthy observation that 97% of the participants hailed from either Scheduled, Backward or Most Backward castes in comparison to 3% from Forward caste who formed a minority in this rural area.

FIGURE 3: CATEGORIZATION ACCORDING TO CASTE SYSTEM (N=300)

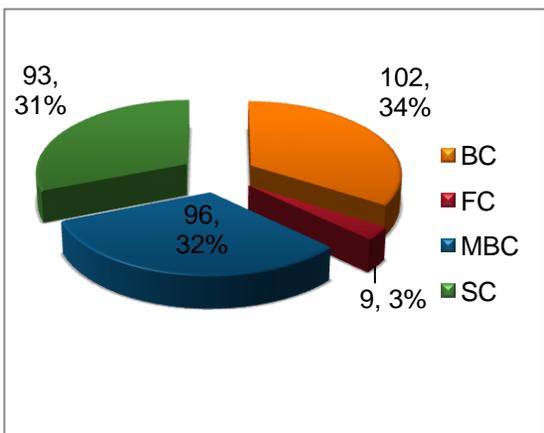
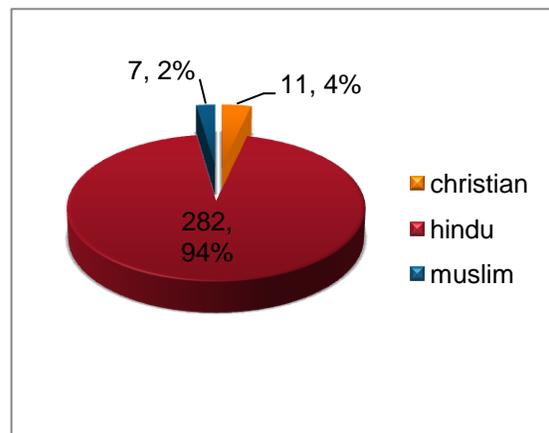
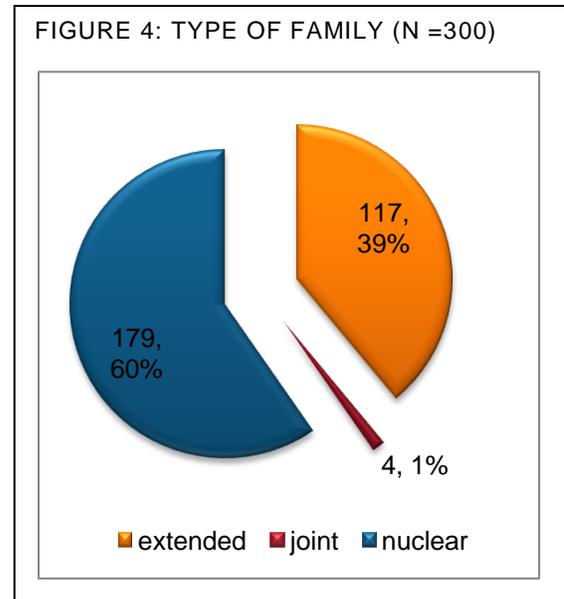
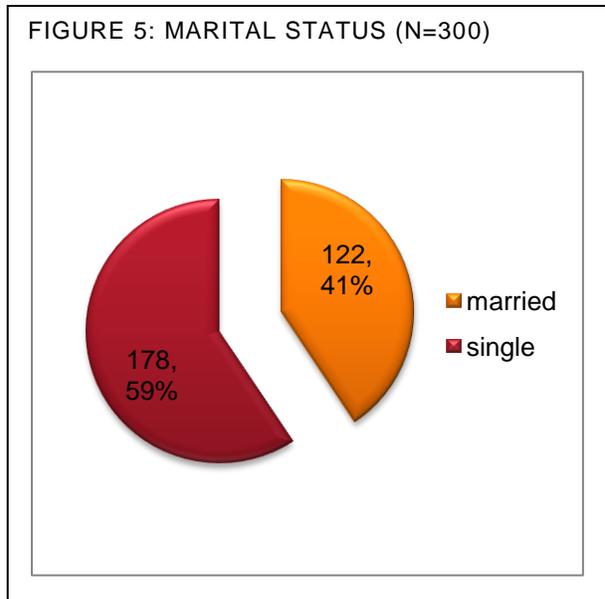


FIGURE 2: CATEGORIZATION ACCORDING TO RELIGION (N=300)



5.1.1.3 TYPE OF FAMILY AND MARITAL STATUS

We found about three fifth of the families (179, 59.7%) are of nuclear type families as compared to joint families (1.3%) and extended families (39%). About forty one percent of them were married and there was no one who was separated or divorced. Of the 41% married, 94.6% of them had fathered at least 1 child.



5.1.1.4 EDUCATIONAL, OCCUPATIONAL, EMPLOYMENT AND INCOME PROFILE

Taking the educational profile of the study population into consideration, it was observed that nearly one quarter of the participants (26.7%) had no formal education or were educated upto primary school level only and about 40% had education upto secondary school level and had discontinued thereafter. Among the 300 participants, 26 of them were students pursuing some form of education; hence they were not expected to have any mode of regular income. Within this student group, there were two individuals who collected a pocket money of Rs.700 & Rs.800 from live-stocks

and one individual who received a stipend of Rs.1500 as a chartered accountant trainee. Out of the 274 members who were expected to be involved in gainful employment for providing financial support to their family, some were employed (82.3%) in varied occupations or had a self-business (7.0%). Nearly two thirds of the study group (67.6%), worked as unskilled workers or Grade IV workers as compared to two individuals who were working as senior professionals in private companies for more than 5years duration. There were 6 participants, who were unemployed and had no means of income. The median income of this population was about 7000 and maximum being Rs.40000 In the group of participants who were employed, the minimum monthly income was Rs. 1000; which was similar to the minimum monthly income of Rs.1500 among those who had a self-business. According to the Tamil Nadu Government Regulations, the minimum wages per day for a man is Rs.100. After classification of monthly income based on minimum wages, it was noted that 29 (10.6%) had a monthly income of less than Rs.3000 amongst the expected to be gainfully employed group. It was also observed that less than 10% of the participants in either employed or self business group earned less than Rs. 3000 per month (Table 2).

TABLE 2 : DISTRIBUTION OF MONTHLY INCOME WITH RESPECT TO TYPE OF EMPLOYMENT (N=268)

Employment Status	Total monthly Income [Number (%)]		Total
	< Rs.3000	>= Rs.3000	
Employed	20 (8.08)	227 (91.92)	247
Self-Business	3 (15.0)	18 (85.0)	21
Total	23 (8.58)	245 (91.42)	268

FIGURE 6: EDUCATIONAL PROFILE (N=300)

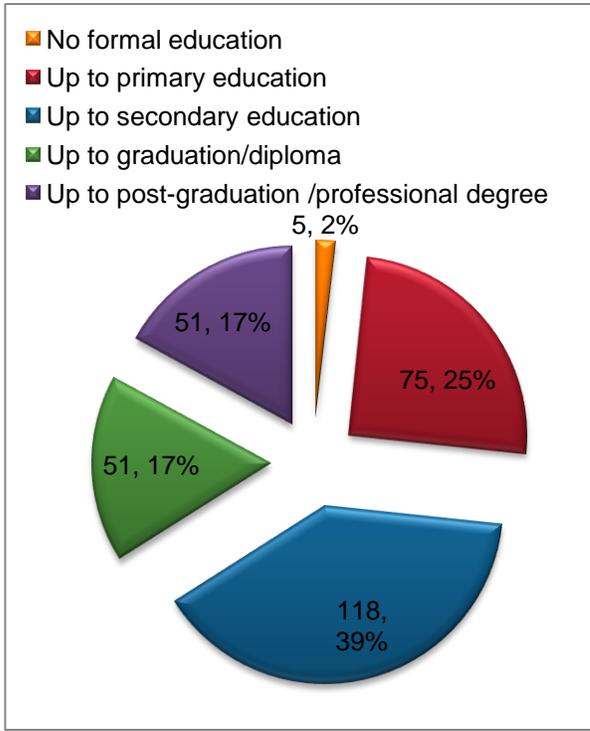


FIGURE 7 : OCCUPATIONAL PROFILE (N=300)

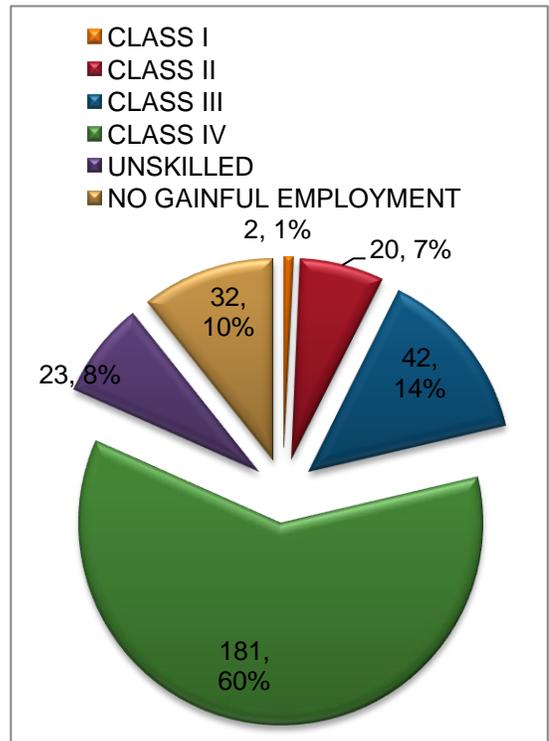
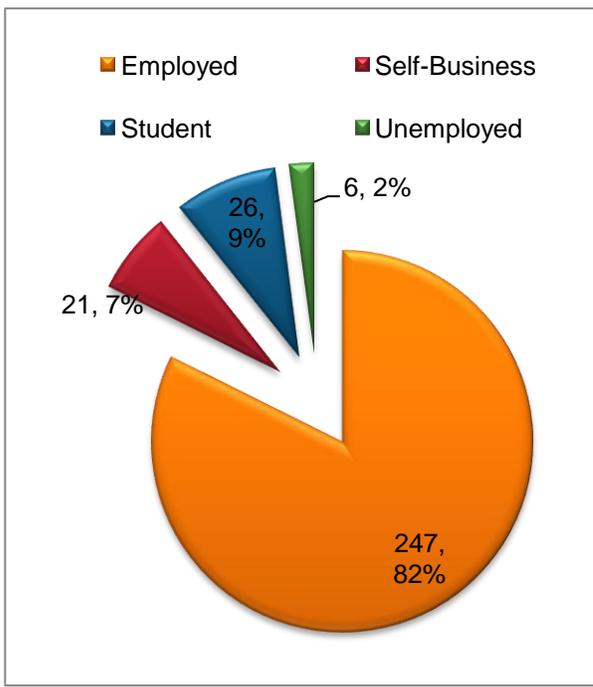


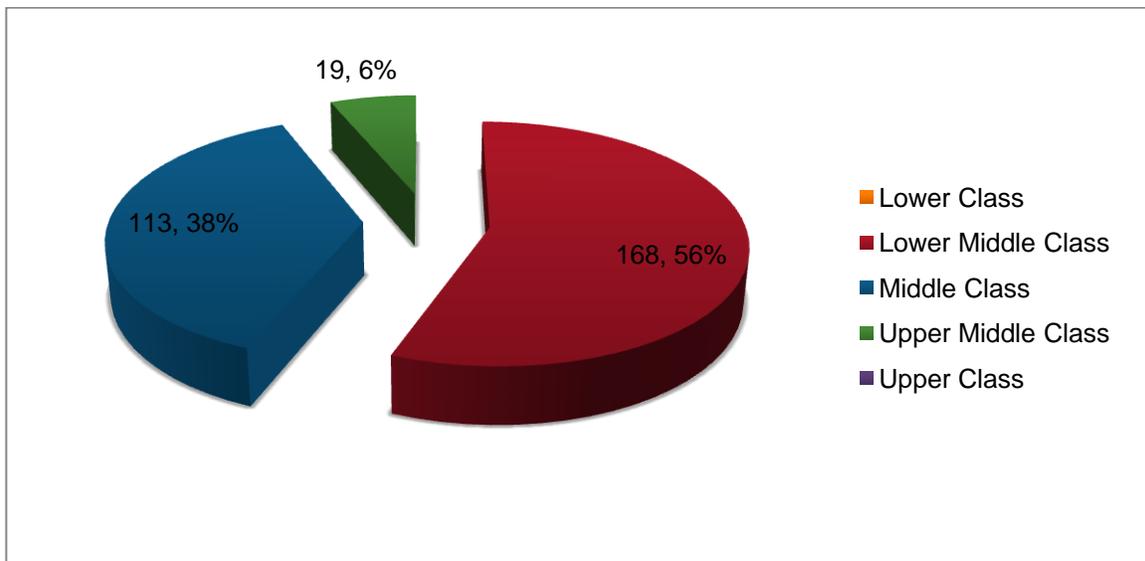
FIGURE 8: EMPLOYMENT PROFILE (N=300)



5.1.1.5 SOCIO-ECONOMIC STATUS STRATIFICATION

The ICMR scale was used for assessment of the socio-economic status. The scores of each of the seven domains were added to obtain the SES score, which was then classified into five categories of lower class, lower middle class, middle class, upper middle class and upper class. Analysis of the SES score revealed that 56% of the population belonged to the lower middle class, 37.7% belonged to the middle class and 6.3% belonged to the upper middle class. There were no individuals belonging to the upper or lower classes.

FIGURE 9: ICMR SOCIO-ECONOMIC STATUS (N=300)



5.1.2 PREVALENCE OF ALCOHOL USE

This study measured the prevalence of alcohol use amongst males aged 20-35 years in rural Tamil Nadu. Prevalence was assessed based on alcohol use in the last 1 year as current users and also the participants who had consumed alcohol at any point of time in their lives but not in the last one year were considered for calculation of prevalence of ever users of alcohol. Among the current users, those who scored 1-7 in AUDIT scale were classified as non-problem drinkers and those who scored 8 and above were classified as problem drinkers.

In the survey conducted, it was found that 54.3% of the population (Table 3) had consumed alcohol at some point of time in their life but not all of them had used alcohol in the last 1 year. Currently, 49.7% of the total population consumes alcohol and about 30% of the study participants have problem drinking habit. Among the alcohol users(49.7%), nearly three-fifths (59.7%) are problem drinkers. (Table 3)

TABLE 3: PREVALENCE OF ALCOHOL CONSUMPTION (N =300)

Prevalence	Number	Percent
Ever users of alcohol	163	54.3
Non –drinkers (current)	151	50.3
Non-problem drinkers	60	20.0
Problem drinkers	89	29.7

AGE AT FIRST DRINK

The study found that the earliest age at first drink was 12 years. Amongst all those who had ever consumed alcohol in their lives, the mean age ($\pm 2SD$) at initiation of alcohol use was 21.62 (± 7.228) years. The most common age at which young adults started consuming alcohol was 20years (Table 4).

TABLE 4: AGE IN YEARS AT FIRST DRINK AMONGST LIFE TIME USERS OF ALCOHOL (N=163)

Minimum Age	12
Maximum Age	33
Mean Age (S.D)	21.62(3.61)
Mode Age	20

5.1.3 ALCOHOL RELATED CHARACTERISTICS

5.1.3.1 AUDIT Questionnaire Survey

The AUDIT questionnaire helped us in obtaining an insight into the alcohol consumption characteristics of the study population (Table 5). From the participants who were interviewed 35% consumed alcohol on once a week basis or less frequently, 12% consumed alcohol more than once in a week and 2.7% consumed alcohol more than four times a week. Although 20.7% of the men admitted to occasional episodes of binge drinking over the past one year and 6% admitted to binge drinking every month, the usual amount of alcohol consumption in nearly a quarter of the study population (26.7%) was either a bottle of beer or one quarter of

IMFL. Most of the men (46.4%) restricted to drinking either two bottles of beer or two quarters of IMFL. 6.9% of alcohol users needed a morning drink to get them going. Eighteen participants gave history of being involved in violence or a brawl following alcohol use, within the past one year. Majority reported that drinking was not supported by the near and dear ones of alcohol users, as nearly three quarters (75.8%) of alcohol consumers were advised to quit drinking.

TABLE 5: DISTRIBUTION OF THE ITEMS ASSESSING ALCOHOL USE IN THE AUDIT QUESTIONNAIRE (N =300)

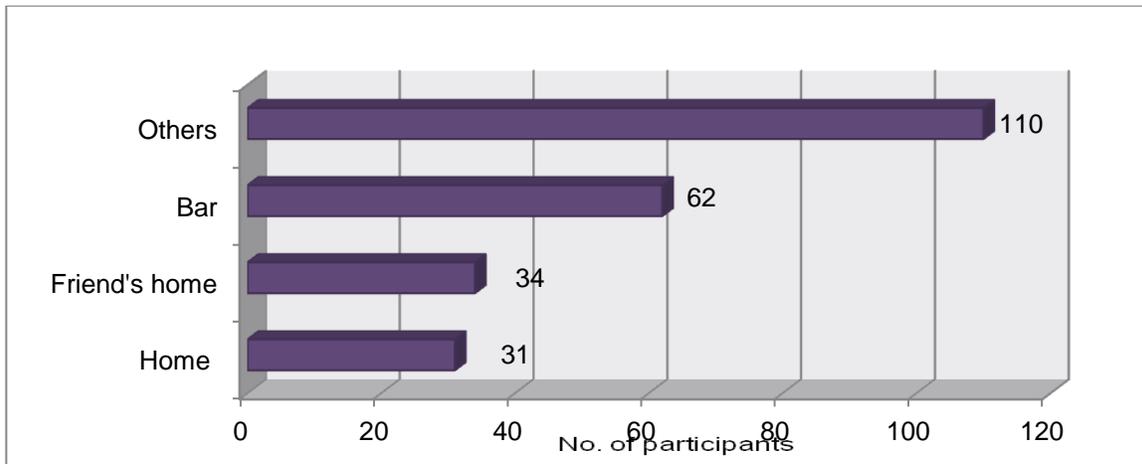
No.	Questions	Response	Frequency	Percent
1	How often do you have a drink containing alcohol?	Never	151	50.3
		monthly or less	27	9.0
		2-4 times a month	78	26.0
		2-3 times a week	36	12.0
		4 or more times a week	8	2.7
2	How many drinks containing alcohol do you have on a typical day when you are drinking?	1or2	80	26.7
		3or4	59	19.7
		5or6	7	2.3
		7, 8 or 9	3	1.0
		10 or more	0	0.0
3	How often do you have six or more drinks on one occasion?	Never	69	23.0
		less than monthly	62	20.7
		Monthly	15	5.0
		Weekly	3	1.0
		Daily or almost daily	0	0.0
4	How often during the last year have you found that you were not able to stop drinking once you had started?	Never	98	32.7
		less than monthly	45	15.0
		Monthly	6	2.0
		Weekly	0	0.0
		Daily or almost daily	0	0.0

No.	Questions	Response	Frequency	Percent
5	How often during the last year have you failed to do what was normally expected from you because of drinking?	never	116	38.7
		less than monthly	23	7.7
		monthly	10	3.3
		weekly	0	0.0
		Daily or almost daily	0	0.0
6	How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?	never	129	43.0
		less than monthly	10	3.3
		monthly	9	3.0
		weekly	1	0.3
		Daily or almost daily	0	0.0
7	How often during the last year have you had a feeling of guilt or remorse after drinking?	never	64	21.3
		less than monthly	46	15.3
		monthly	38	12.7
		weekly	1	0.3
		Daily or almost daily	0	0.0
8	How often during the last year have you been unable to remember what happened the night before because you had been drinking?	never	116	38.7
		less than monthly	24	8.0
		monthly	8	2.7
		weekly	1	0.3
		Daily or almost daily	0	0.0
9	Have you or someone else been injured as a result of your drinking?	no	131	43.7
		yes but not last year	3	1.0
		yes during last year	15	5.0
10	Has a relative or friend or a doctor or another health worker been concerned about your drinking or suggested you cut down?	No	36	12
		yes but not last year	1	0.3
		yes during last year	112	37.3

5.1.3.2 Locus of Alcohol Consumption

Among those who are current users of alcohol (n=149), most of them (73.8%) commonly drink in open spaces like fields, roadside areas, construction sites and during functions. About 20% also drink at home and/or friends home and about 40% at TASMALC bars.

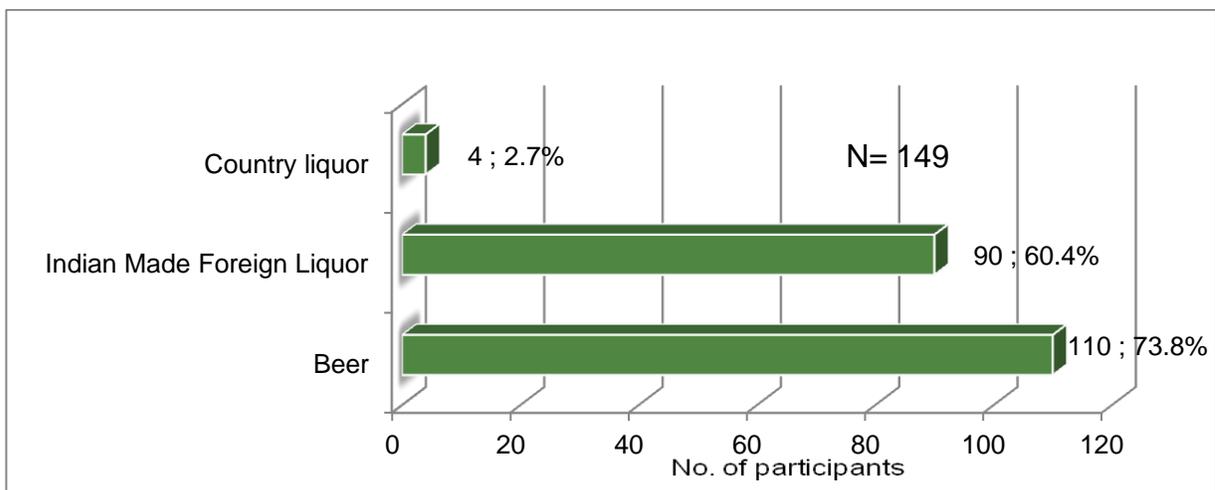
FIGURE 10: USUAL LOCATIONS FOR ALCOHOL CONSUMPTION (N=149)



5.1.3.3 Preferred Type Of Alcohol

We wanted to know if there was a preference towards any particular type of alcohol. Only 2.7% of all alcohol consumers in the past year (N=149), reported to consume country liquor but refused to reveal the source. The most commonly consumed alcohol was beer (73.8%) and among them 54 (49.09%) participants consumed both beer and IMFL.

FIGURE 11: PREFERRED TYPE OF ALCOHOL CONSUMED (N=149)



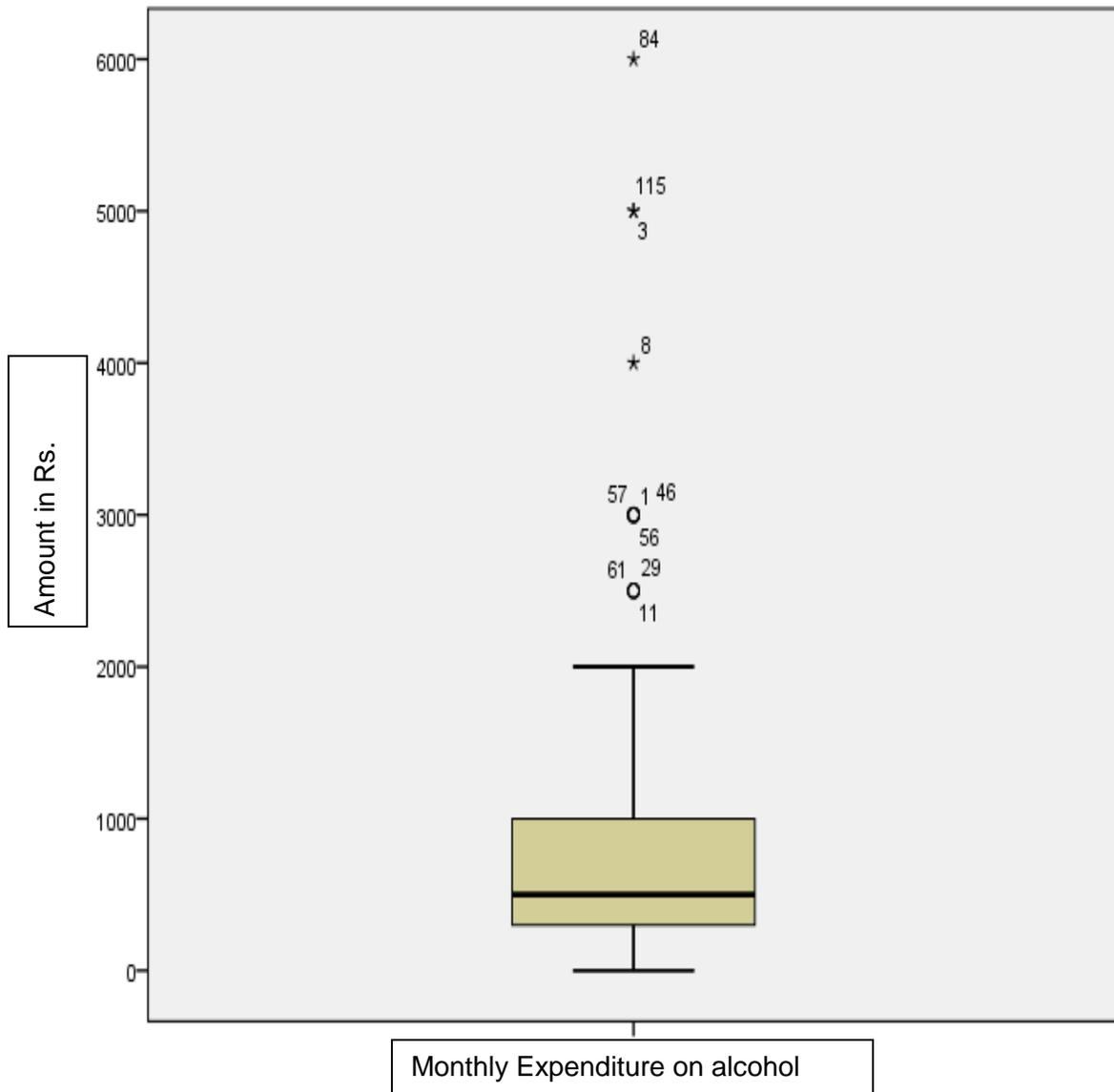
5.1.3.4 Monthly Expenditure On Alcohol

In this study we wanted to know how much expense was an individual incurring towards alcohol on a monthly basis (Table 6). The mean (95% CI) expenditure on alcohol per month was Rs.881.07 (723.18 - 1038.95) which was more than one tenth of the median income per month of the study population. There was one individual who consumed alcohol only on occasions or functions and another individual who consumed alcohol only if it was sponsored by his friends, hence both of them did not incur any expenditure towards the purchase of alcohol. The minimum amount spent by a participant, other than the above mentioned individuals, for the purpose of consuming alcohol, was Rs. 40 in a month (Fig 12).

TABLE 6: MONTHLY EXPENDITURE ON ALCOHOL IN RS. (N=149)

Maximum	6000
Range	6000
Mean (95% Confidence Interval)	881.07 (723.18 - 1038.95)
Median	500

FIGURE 12: BOX PLOT REPRESENTATION OF MONTHLY EXPENDITURE AMONG ALCOHOL USERS (N=149)



5.1.3.5 Reasons Ascribed To Consumption Of Alcohol

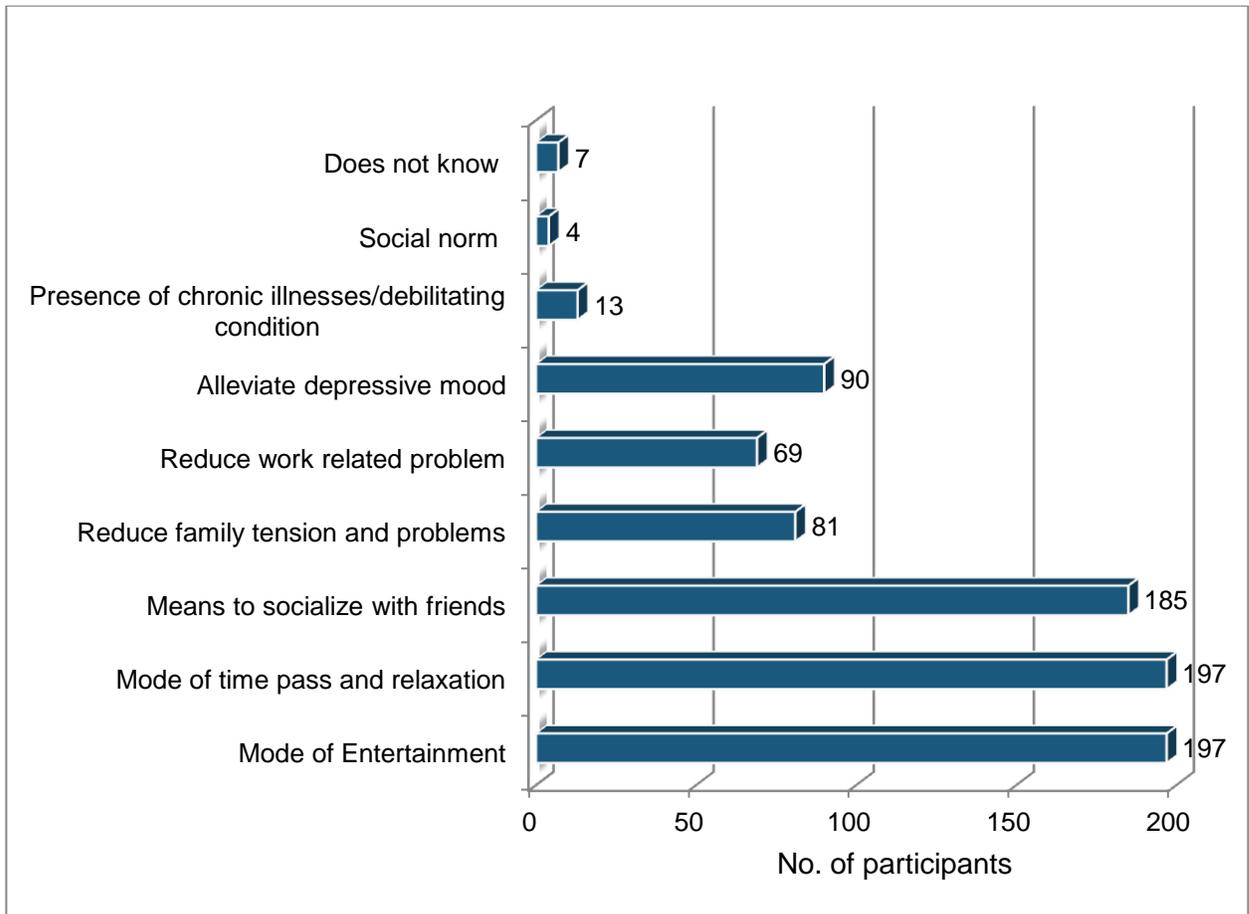
We wanted to know their opinion about why young people drink alcohol (Table 7).

TABLE 7: REASONS ATTRIBUTED TO CONSUMPTION OF ALCOHOL IN THE STUDY POPULATION (N=300)

Reason	Frequency	Percent
Mode of Entertainment	197	65.7
Mode of time pass and relaxation	197	65.7
Means to socialize with friends	185	61.7
Reduce family tension and problems	81	27.0
Reduce work related problem	69	23.0
Alleviate depressive mood	90	30.0
Presence of chronic illnesses/debilitating condition	13	4.3
Social norm	4	1.3
Does not know	7	2.3

Table 7 shows that according to them most young people drank because it served as a mode of entertainment (65.7%) or as a mode of time pass and relaxation (65.7%) and provided for means to socialize with friends (61.7%). Only a small percentage of people resorts to alcohol to resolve family tension/problems (27%) or work related problems (23%). The 7 individuals (2.3%) who were not aware of any particular reason for consumption of alcohol were non-drinkers.

FIGURE 13: REASONS FOR CONSUMING ALCOHOL (N=300)



5.1.4 ATTITUDE TOWARDS ALCOHOL CONSUMPTION

5.1.4.1 Regan Attitude towards Non-Drinkers Scale (RANDS)

In our study we wanted to know the attitude of an individual towards non-drinkers. The hypothesis is that the nature of refusing to consume alcohol was inherent amongst non-drinkers and consumption of alcohol may serve as a means of avoiding social costs associated with being a non-drinker. For this purpose we used the

Regan Attitude towards Non-drinkers Scale. Table 8 displays the responses to 11 questions included in the scale.

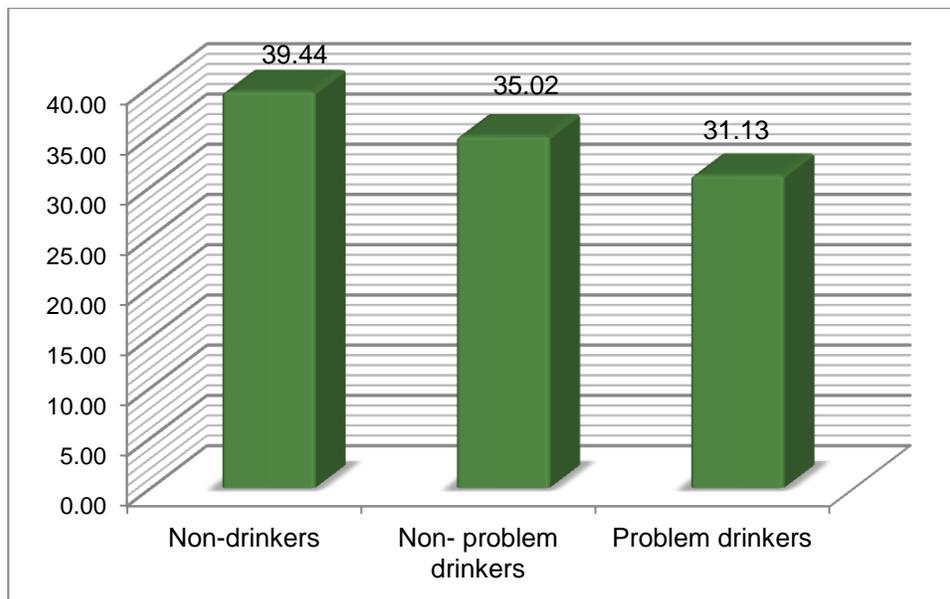
TABLE 8: DISTRIBUTION OF ITEMS ASSESSING THE ATTITUDE TOWARDS NON-DRINKER IN THE RANDS QUESTIONNAIRE (N=300)

S. No.	Questions	Response	Frequency	Percent
1	I would not see there being a problem socially, with myself being a non-drinker	strongly agree	4	1.3
		Agree	296	98.7
		Undecided	0	0
		Disagree	0	0
		strongly disagree	0	0
2	If I were a non-drinker, I believe my friends would treat me differently	strongly agree	1	0.3
		Agree	28	9.3
		Undecided	1	0.3
		Disagree	264	88.0
		strongly disagree	6	2.0
3	I would have just as much success with romantic/sexual partners if I were a non-drinker	strongly agree	1	0.3
		Agree	278	92.7
		Undecided	7	2.3
		Disagree	14	4.7
		strongly disagree	0	0
4	I would find it very hard to enjoy my social life if I were a non-drinker	strongly agree	3	1.0
		Agree	62	20.7
		Undecided	2	0.7
		Disagree	220	73.3
		strongly disagree	13	4.3
5	I think being a non-drinker would negatively affect my life	strongly agree	9	3.0
		Agree	46	15.3
		Undecided	1	0.3
		Disagree	214	71.3
		strongly disagree	30	10.0
6	Non-drinkers don't know what fun they're missing	strongly agree	1	0.3
		Agree	33	11.0
		Undecided	2	0.7
		Disagree	248	82.7
		strongly disagree	16	5.3

S. No.	Questions	Response	Frequency	Percent
7	I think it is strange when people of my age do not drink	strongly agree	10	3.3
		Agree	2	0.7
		Undecided	285	95.0
		Disagree	3	1.0
		strongly disagree	0	0
8	I would hate to be a non-drinker	strongly agree	9	3.0
		Agree	80	26.7
		Undecided	2	0.7
		Disagree	171	57.0
		Strongly disagree	38	12.7
9	Spending time with drinkers is more fun than spending time with non-drinkers	strongly agree	9	3.0
		Agree	121	40.3
		Undecided	2	0.7
		Disagree	132	44.0
		strongly disagree	36	12.0
10	Non-drinkers tend to be repressed	strongly agree	4	1.3
		Agree	111	37.0
		Undecided	3	1.0
		Disagree	181	60.3
		strongly disagree	1	0.3
11	An evening with a non-drinker tends to be predictable and reliable	strongly agree	119	39.7
		Agree	2	0.7
		Undecided	179	59.7
		Disagree	0	0
		strongly disagree	0	0

RANDS was developed on the basis of attitude towards non-drinkers. It proposed that if an individual's inherent nature was not to consume alcohol then they were unlikely to become problem drinkers. Higher the RANDS score, the more unlikely was the person to use alcohol or become problem drinker.

FIGURE 14: DISTRIBUTION OF RANDS MEAN SCORE (N=300)



5.1.4.2 ATTITUDES TOWARDS ALCOHOL CONSUMPTION

After classifying the participants as non-drinkers, non-problem drinkers and problem drinkers, we also assessed the difference in their attitudes to drinking alcohol based on 3 questions as follows: being felt left out if they did not consume alcohol when their friends were consuming alcohol; friends making fun of them if they refused to consume alcohol when offered; and the feeling of popularity increasing after consuming alcohol; the results of which have been shown in Table 9.

TABLE 9: ATTITUDES AMONG NON-DRINKERS, NON-PROBLEM DRINKERS AND PROBLEM DRINKERS (N=300)

Characteristics	Frequency [Number (%)]			Total [Number (%)]
	Non-Drinkers	Non-problem drinkers	Problem drinkers	
Feels Left Out when friends are drinking	1 (1.7)	9 (15.5)	48 (82.8)	58 (19.3)
Friends make fun if they refuse alcohol	16 (20.8)	16 (20.8)	45 (58.4)	77 (25.7)
Feels popularity increases after consuming alcohol	7 (17.5)	8 (20.0)	25 (62.5)	40 (13.3)

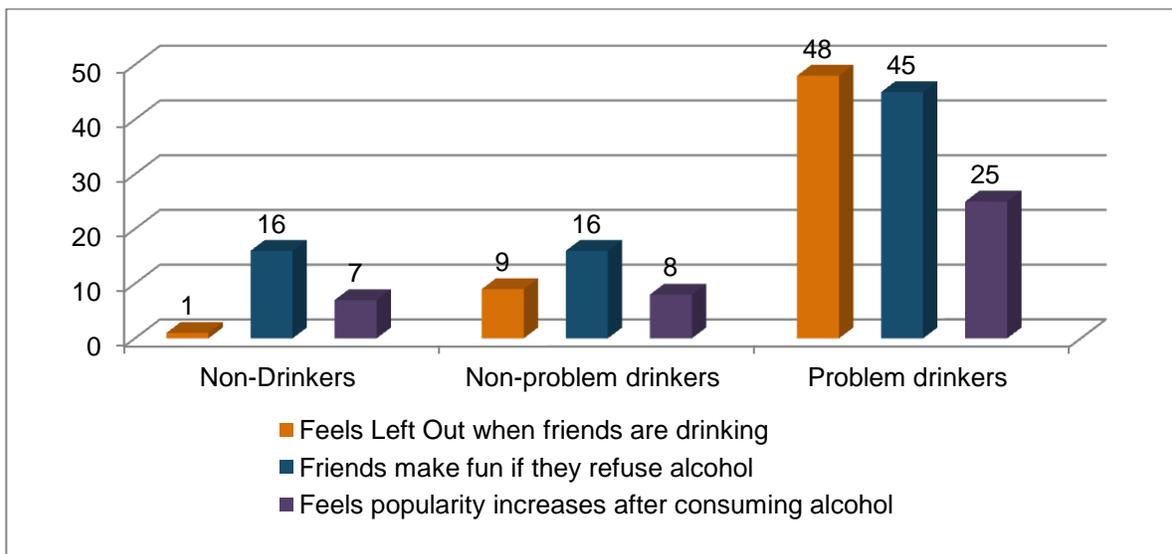
The study found that:

19.3% of the total study population felt left out if they did not consume alcohol when their friends were consuming alcohol, of which 82.8% were problem drinkers.

25.7% of the total study population reported that their friends making fun of them if they refused to consume alcohol when offered, of which 58.4% were problem drinkers, 20.8% were non-problem drinkers and 20.8% were non-drinkers. Even amongst people who do not consume alcohol, their friends still make fun of them if they refuse to drink.

13.3% of the total study population feels that popularity increases after consuming alcohol, of which 62.5% were problem drinkers.

FIGURE 15: ATTITUDES AMONG NON-DRINKERS, NON-PROBLEM DRINKERS AND PROBLEM DRINKERS (N=300)



5.1.5 PATTERNS OF ALCOHOL CONSUMPTION

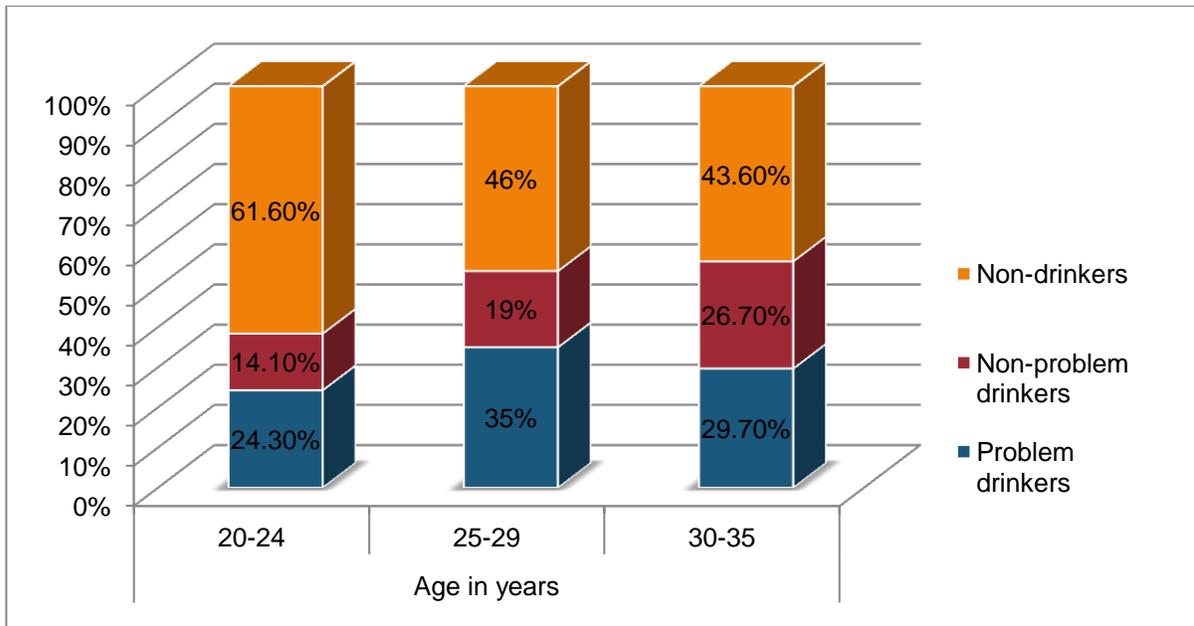
5.1.5.1 Age

In our study, we wanted to observe for any specific pattern of alcohol consumption related to the age of the participants that may be prevalent in the study population (Table 10).

TABLE 10: DISTRIBUTION OF ALCOHOL USERS BY AGE (N=300)

AUDIT SCORE	Age in years			Total
	20-24 n=99	25-29 n=100	30-35 n=101	
Non-drinkers	61 (61.6%)	46 (46%)	44 (43.6%)	151
Non-problem drinkers	14 (14.1%)	19 (19%)	27 (26.7%)	60
Problem drinkers	24 (24.3%)	35 (35%)	30 (29.7%)	89
Total	99	100	101	300

FIGURE 16: AGE DISTRIBUTION BY ALCOHOL USAGE (N=300)



We observe that as the age increases, the proportion of individuals consuming alcohol also increases. Amongst the age groups 20-24 years, 25-29 years and 30-35 years the percentages of individuals consuming alcohol were 38.38%, 54.0%, 56.44% respectively. The peak age of problem drinking was 25 - 29 years.

5.1.5.2 Age at First Drink

Since the most common age at initiation of alcohol consumption was 20 years, we dichotomized the age at first drink among non-problem drinkers and problem drinkers as less than or equal to 20 years and greater than 20 years. Non-drinkers were not taken into consideration for the analysis. The results of this outcome have been described in Table 11.

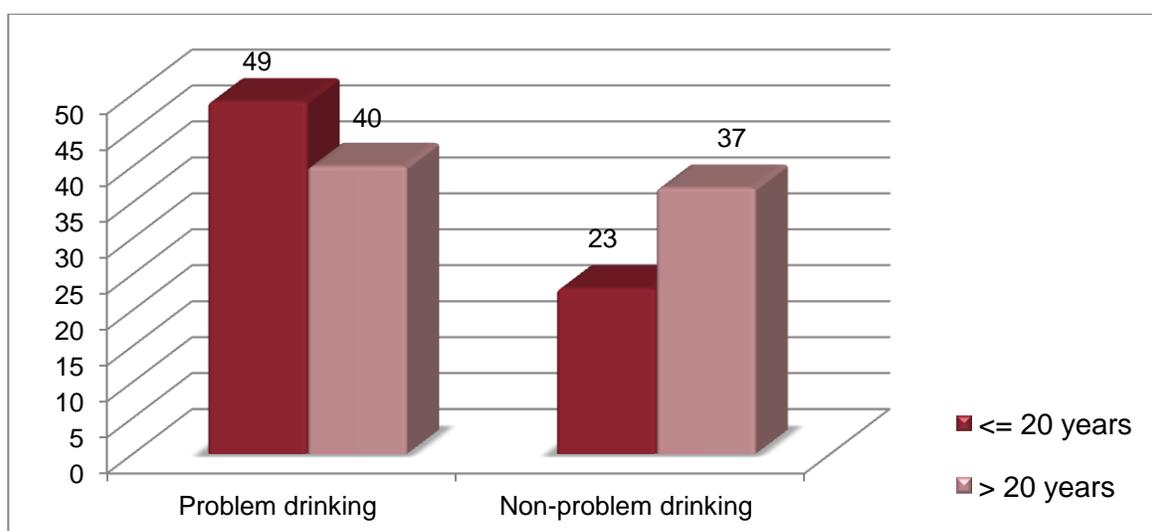
TABLE 11: ASSOCIATION BETWEEN PROBLEM DRINKING AND AGE AT FIRST DRINK (N=149)

Age at first drink	Frequency [Number (%)]		Total
	Problem drinking	Non-problem drinking	
<= 20 years	49 (55.1%)	23 (38.3%)	72
> 20 years	40 (44.9%)	37 (61.7%)	77
Total	89	60	149

Test of significance = 4.014 P – value = 0.045 OR (95%CI) = 1.97 (1.01 – 3.84)

Results showed that people who started consuming alcohol at an early age were more prone to problem drinking as compared to late starters. Among problem drinkers 55.1% had started consuming alcohol at an age <=20 years in comparison to 38.3% in non-problem drinkers. A significant association (p-value 0.045) between early starters (<=20 years) and problem drinking was observed with an odds for becoming a problem drinker 97% higher among early starters when compared with late starters [OR=1.97 (CI=1.0 –3.84)].

FIGURE 17: AGE AT FIRST DRINK (N=149)



5.2 RISK FACTORS FOR PROBLEM DRINKING - ANALYSIS USING CASE CONTROL APPROACH

The study was designed to identify correlates of alcohol consumption leading to problem drinking. Bivariate analyses of all the possible factors were performed. Those factors which had a significant association with problem drinking were evaluated for its independent association using binary logistic regression analysis.

In the study, after administering the AUDIT questionnaire, we classified participants as non- drinkers, non-problem drinkers and problem drinkers and the numbers in each category were 151, 60 and 89 respectively. We defined cases as problem drinkers (AUDIT score ≥ 8) and controls as non- drinkers and non-problem drinkers (AUDIT score 1 – 7). Although we needed only 56 cases and 56 controls; as there were 89 cases identified, we analyzed all 89 cases and 211 controls, which would increase the power of the study to calculate the association between many other less prevalent risk factors. A biological plausibility between exposure and outcome was taken into consideration at the outset of the analysis. The risk factors assessed were age, single parent / no parent alive during the early life period, marital status, socio-economic status, use of alcohol by parents, alcohol consumption by family members other than parents, indulgence in alcohol by friends, compulsion and encouragement by friends to drink, participation in activities other than work and attitude towards non-drinkers assessed by RANDS score.

5.2.1 BIVARIATE ANALYSIS

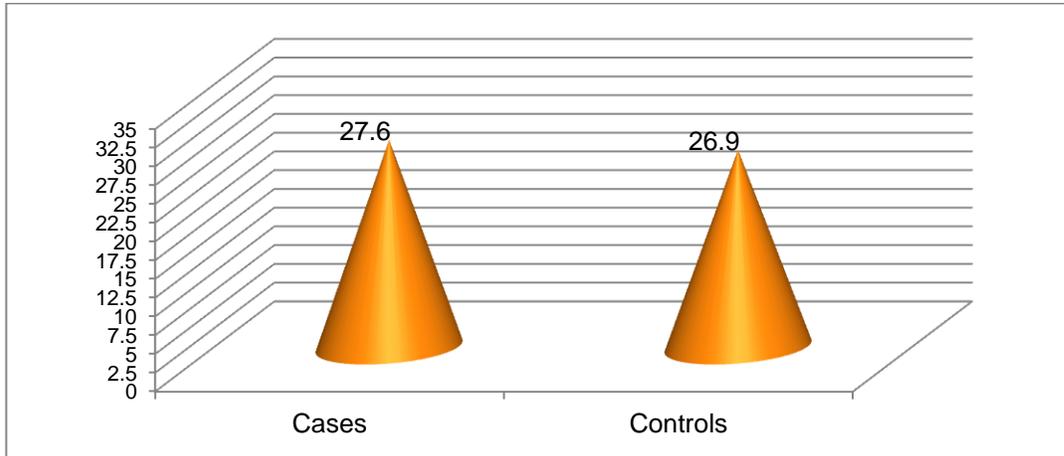
The following Table 12 shows the association between potential risk factors and problem drinking.

TABLE 12: ASSOCIATION BETWEEN ENCOURAGING / DISCOURAGING FACTORS AND PROBLEM DRINKING (N=300)

Risk Factors		Cases	Controls	p-value	Unadjusted Test of significance and Strength of association
Age [Mean (SD)]		27.6 (4.3)	26.9 (4.7)	0.24	[Mean Difference (95%CI)] [0.68 (-0.46 to 1.83)]
Married [Number (Percent)]	Married	42 (47.2)	80 (37.91)	0.13	[Odds Ratio (95 % CI)] 1.46 (0.89 – 2.41)
	Single	47 (52.8)	131 (62.09)		
Low Socio-economic Status [Number (Percent)]	Lower Middle Class	64 (71.9)	104 (49.29)	<0.001	[Odds Ratio (95 % CI)] [2.63 (1.54 – 4.50)]
	Middle Class and Upper Middle Class	25 (28.1)	107 (50.7)		
Disorganized early life family structure [Number (Percent)]	Orphan / Single parent	13 (14.6)	30 (14.2)	0.93	[Odds Ratio (95 % CI)] [0.97 (0.48 – 1.96)]
	Both parents Alive	76 (85.3)	181 (85.8)		
Parents consume alcohol [Number (Percent)]		55 (61.8)	99 (46.9)	0.019	[Odds Ratio (95 % CI)] [1.83 (1.10 – 3.04)]
Other family members consume alcohol [Number (Percent)]		57 (64.0)	87 (41.2)	<0.001	[Odds Ratio (95 % CI)] [2.54 (1.52 – 4.24)]
Friends consume alcohol [Number (Percent)]		84 (94.4)	146 (69.2)	<0.001	[Odds Ratio (95 % CI)] [7.48 (2.90 – 19.31)]
Friends encouraging to drink [Number (Percent)]		69 (77.5)	70 (33.2)	<0.001	[Odds Ratio (95 % CI)] [6.95 (3.91 – 12.34)]
Participation in extra-curricular activities [Number (Percent)]		31 (34.8)	95 (45.0)	0.102	[Odds Ratio (95 % CI)] [0.65 (0.391 – 1.09)]
RANDS Score [Mean score (SD)]		31.13 (4.6)	38.18 (3.5)	<0.001	[Mean Difference (95%CI)] [-7.05 (-8.13 to -5.97)]

AGE DISTRIBUTION AMONG CASES AND CONTROLS

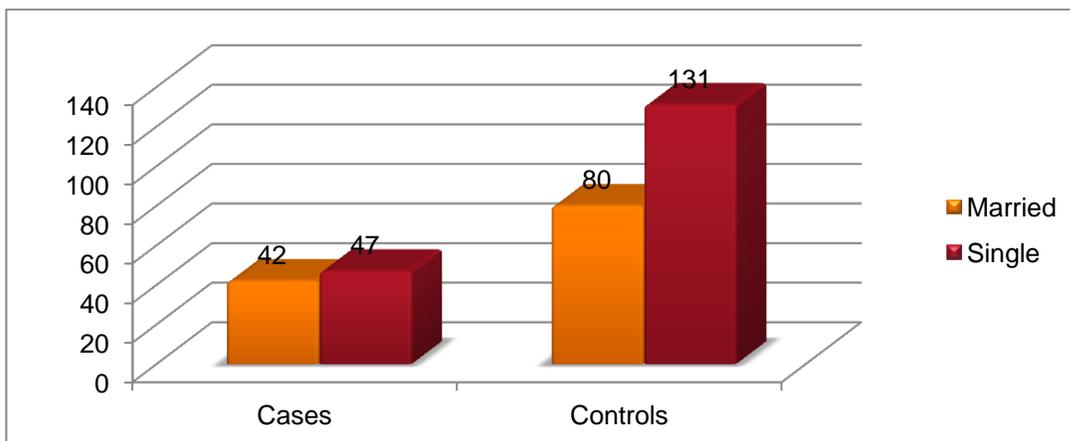
FIGURE 18: MEAN AGE IN YEARS AMONG CASES AND CONTROLS (N=300)



The mean age among cases and controls were 27.6years and 26.9years respectively. The mean difference (95% CI) was 0.68 (-0.46 to 1.83) and an independent t-test showed that there was no significant association between age and problem drinking (p-value 0.24).

MARITAL STATUS

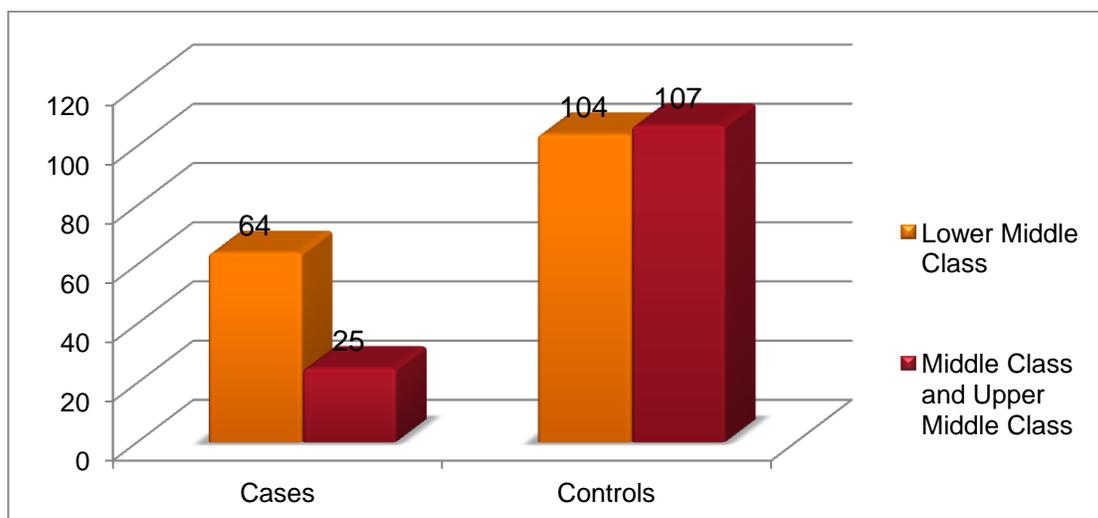
FIGURE 19: MARITAL STATUS AMONG CASES AND CONTROLS (N=300)



We posited marriage to have an incremental effect on alcohol consumption. The bivariate association showed marital status is not significantly associated with problem drinking (p-value = 0.13).

SOCIO-ECONOMIC STATUS

FIGURE 20: DISTRIBUTION OF SOCIO-ECONOMIC STATUS OF CASES AND CONTROLS (N=300)



The comprehensive ICMR SES scale classified the study population into three classes' viz. lower middle class, middle class and upper middle class. Because of similar attributes of middle class and upper middle class, they were categorized together. The study found that SES was significantly associated with problem drinking (p <0.001). The odds of becoming a problem drinker for a person from the lower ranks of socio-economic status was 2.6 times higher when compared with people from higher socioeconomic status [OR=2.63 (95% CI=1.54 – 4.50)].

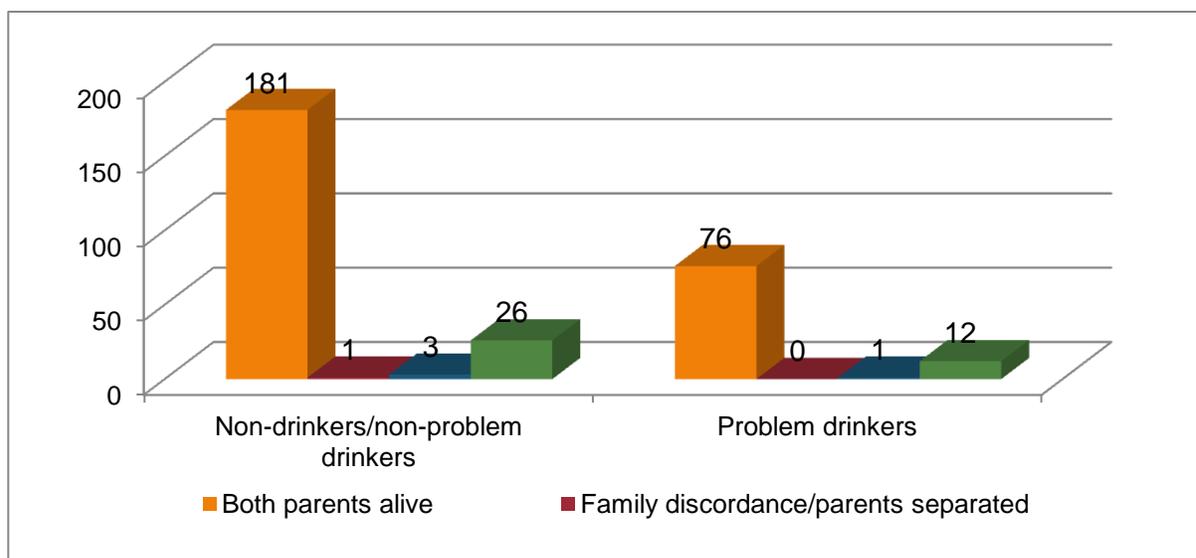
EARLY LIFE FAMILY STRUCTURE

The early life family structure of all the participants showed that only 12.7% came from single living parent family, 1.3% lost both their parents and 0.3% had parents who were separated in comparison to 85.7% who had both parents alive and living together.

TABLE 13: EARLY LIFE FAMILY STRUCTURE (N =300)

Early Life Family Structure	Frequency [Number (%)]		Total
	Non-drinkers/non-problem drinkers	Problem drinkers	
Both parents alive	181 (85.8)	76 (85.4)	257
Family discordance/parents separated	1 (0.5)	0 (0)	1
Orphan	3 (1.4)	1 (0.5)	4
Single parent alive	26 (12.3)	12 (13.5)	38
Total	211 (70.3)	89 (29.7)	300 (100)

FIGURE 21: EARLY LIFE FAMILY STRUCTURE DISTRIBUTION (N =300)



We classified early life family structure in accordance to the existence of both parents and loss of one or both parents based on the presumption that the guidance and control over behavior were more vigilant when both parents are alive and insecurity faced by disorganized family would contribute to drinking. The results showed that there was no significant association with problem drinking (p -value = 0.93). There were 43 participants who were orphans or with single parents.

CONSUMPTION OF ALCOHOL BY PARENTS OR FAMILY MEMBERS

FIGURE 22: DISTRIBUTION OF PARENTAL CONSUMPTION OF ALCOHOL AMONG CASES AND CONTROLS (N=300)

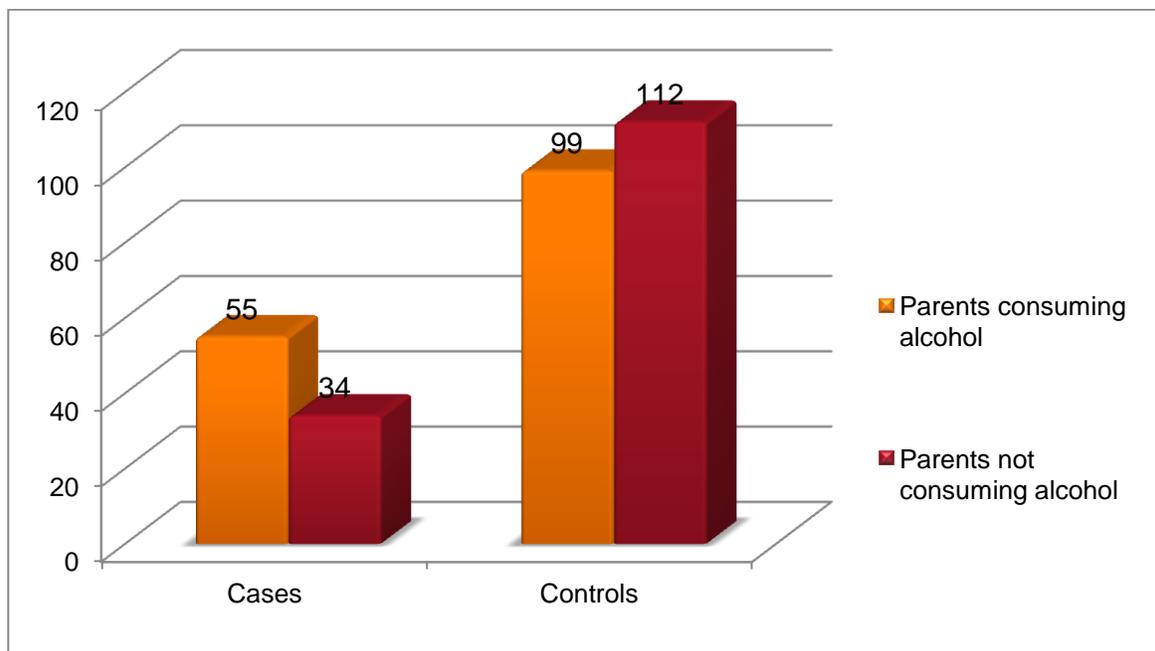
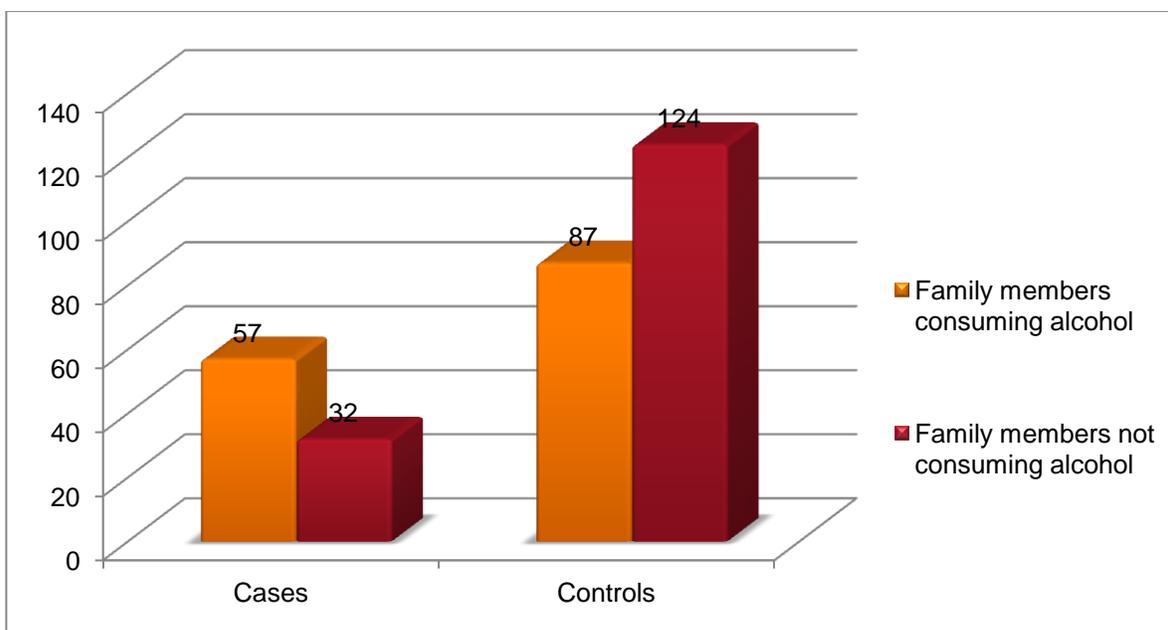


FIGURE 23: DISTRIBUTION OF CONSUMPTION OF ALCOHOL BY OTHER FAMILY MEMBERS AMONG CASES AND CONTROLS (N =300)



Use of alcohol by parents or family members was proposed to be a risk factor for becoming a problem drinker, as individuals are exposed to the concept of drinking at a very early age. Risk factor analysis showed that both exposures of alcohol consumption by parents ($p = 0.019$) [OR (95 % CI); 1.83 (1.10 – 3.04)] and alcohol consumption by other family members ($p < 0.001$) [OR (95 % CI); 2.54 (1.52 – 4.24)] had a strong association with the outcome of problem drinking.

INFLUENCE OF FRIENDS

FIGURE 24: CONSUMPTION OF ALCOHOL BY FRIENDS AMONG CASES AND CONTROLS (N =300)

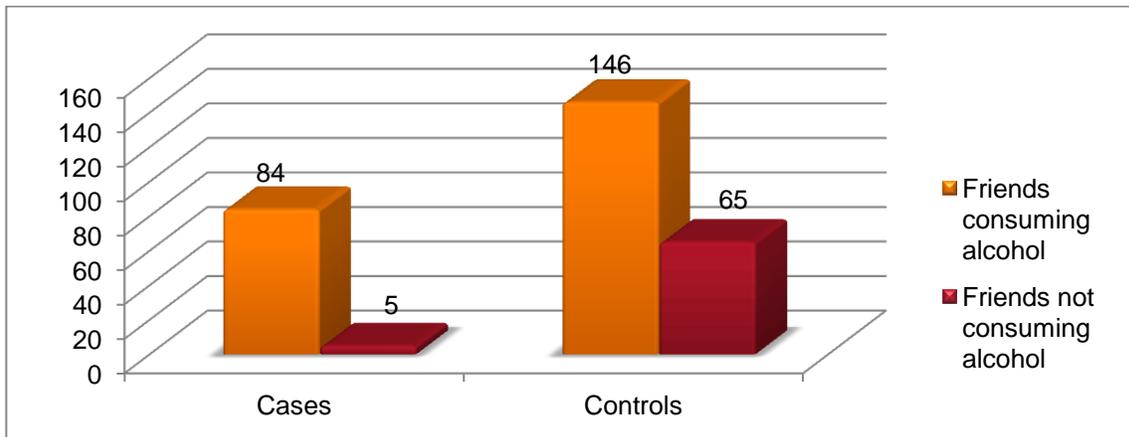
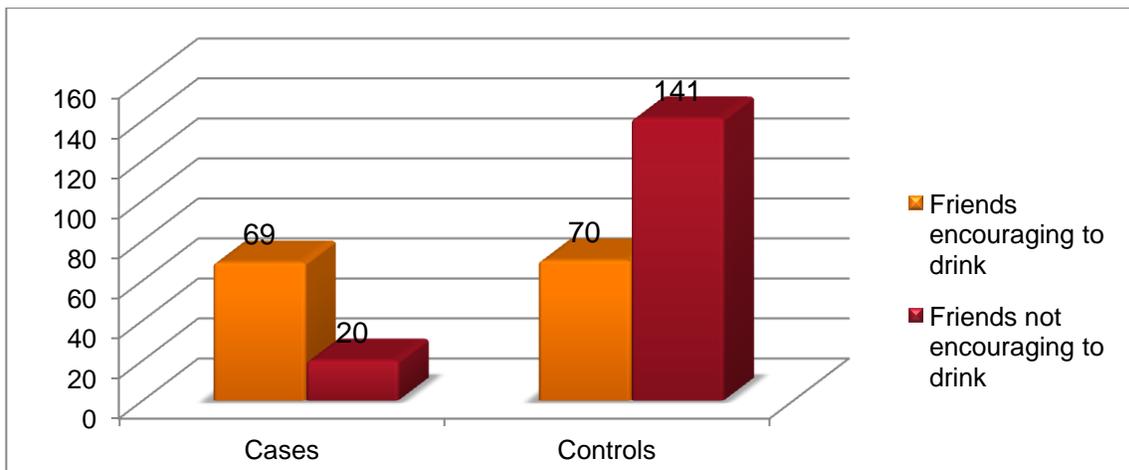


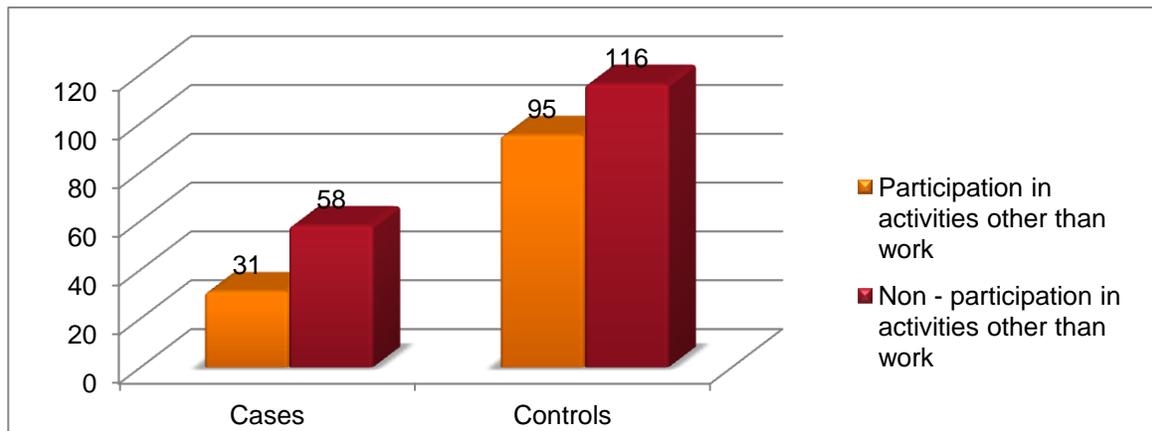
FIGURE 25: FRIENDS PROVIDING ENCOURAGEMENT TO DRINK AMONG CASES AND CONTROLS (N =300)



In this study, peer pressure was evaluated by whether friends consume alcohol and whether they encouraged the participant to consume alcohol. Risk factor analysis showed that the Odds (95 % CI) of becoming a problem drinker were 7.48 times higher(2.90 – 19.31) if friends were consuming alcohol ($p < 0.001$) and 6.95 times higher (3.91 – 12.34) if friends encouraged an individual to drink alcohol ($p < 0.001$).

INVOLVEMENT IN EXTRA CURRICULAR ACTIVITIES

FIGURE 26: PARTICIPATION IN EXTRACURRICULAR ACTIVITIES AMONG CASES AND CONTROLS (N =300)

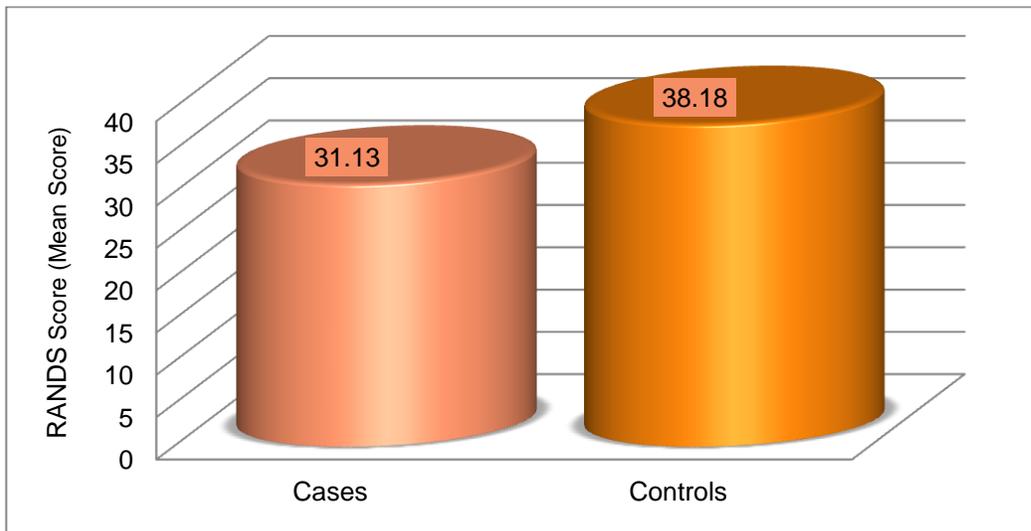


It was proposed that participation in non-work related extracurricular activities would prevent an individual from becoming a problem drinker. Even though the association was not significant at 5% level, it seemed to bring about a 35% reduction in problem drinking if participation in non-work related activities was promoted ($p=0.102$) [OR (95% C.I)] [0.65 (0.391 – 1.09)].

REGAN ATTITUDES TOWARD NON-DRINKERS SCALE ASSESSMENT

The mean RANDES score was calculated amongst cases and controls and the Difference in Mean (95 % CI) was -7.05 (-8.13 to -5.97), for which an Independent t-Test was performed which was found to be statistically significant (p -value <0.001). The controls had higher positive attitude towards non-drinkers than the problems drinkers.

FIGURE 27: DISTRIBUTION OF RANDS SCORE AMONG CASES AND CONTROLS (N =300)



5.2.2 BINARY LOGISTIC REGRESSION MODEL FOR ASSOCIATION BETWEEN RISK FACTORS AND PROBLEM DRINKING

After an evaluation of association between risk factors and the outcome of problem drinking by bivariate analysis, it was noted that 5 factors viz. consumption by parents, consumption by other family members, consumption by friends, encouragement by friends, low socio-economic status had an association with propensity to alcohol abuse whereas the 2 factors viz. participation in non-work related activities and attitude towards non-drinkers which prevented participants from becoming hazardous drinkers. Since encouragement to consume alcohol by friends was highly correlated with friends consuming alcohol, it was not included in the final multivariate model.

MULTIVARIATE MODEL 1

We performed a multivariate analysis for the above mentioned factors to determine the independent effect of each factor on the outcome of problem drinking adjusting for the presence of the other factors, using a binary logistic regression model (Table 14).

TABLE 14: LOGISTIC REGRESSION MODEL (MODEL 1) FOR ASSOCIATION OF FACTORS RELATED TO PROBLEM DRINKING (N=300)

S. No.	Variables	B- coefficient	Sig.	Adjusted Odds ratio	95% C.I. for Odds Ratio	
					Lower	Upper
1	Age	-0.040	0.350	0.961	0.883	1.045
2	Consumption by parents	0.201	0.568	1.223	0.613	2.439
3	Consumption by other family members	0.479	0.180	1.614	0.801	3.252
4	Consumption by friends	1.231	0.031	3.424	1.119	10.484
5	Participation in extra-curricular activities	-0.368	0.352	0.692	0.319	1.501
6	Low Socio-Economic Status	0.669	0.066	1.952	0.956	3.989
7	RANDS Score	-0.345	<0.001	0.708	0.649	0.773

After adjusting for all the risk factors, consumption of alcohol by friends proved to be a significant ($p= 0.031$) independent contributing factor towards becoming a problem drinker, whereas a positive attitude towards non-drinkers emerged to be a significant

($p < 0.001$) preventive characteristic. Every unit increase towards a positive attitude to non-drinkers, there is a 66% reduction in the propensity to become problem drinker.

Consumption of alcohol by friends emerged as the strongest independent risk factor for alcohol use, with an adjusted OR (95% CI) of 3.42 (1.119 – 10.484) ($p=0.031$) after adjusting for other covariates and confounders.

In agreement to Daniel Reagan's view of attitudes toward non-drinkers being an inherent quality to evade the use of alcohol, the RANDS score was found to be a strong independent factor to avoid alcoholism. It showed a reduction in 66% of hazardous alcohol use if people had a positive attitude towards non-drinkers.

Lower socio-economic status was also found to have a nearly significant ($p= 0.06$) association with the outcome of problem drinking.

MULTIVARIATE MODEL 2

The attitude towards non-drinkers may be influenced by the parents or other family members who are alcohol users. Hence the RANDS score would confound the association of the parents and other family members consuming alcohol and problem drinking. Therefore a second multivariate model was constructed, removing the RANDS score (Table 15).

TABLE 15: LOGISTIC REGRESSION MODEL (MODEL 2) FOR ASSOCIATION OF FACTORS RELATED TO PROBLEM DRINKING (N=300)

S. No	Variables	B co-efficient	Sig.	Adjusted Odds ratio	95% C.I. for Adjusted Odds ratio	
					Lower	Upper
1	Age	-0.003	0.927	0.997	0.93	1.07
2	Consumption by parents	0.380	0.182	1.468	0.84	2.58
3	Consumption by family members	0.710	0.014	2.038	1.15	3.60
4	Consumption by friends	2.173	<0.001	8.780	3.30	23.38
5	Participate in Activities	-0.476	0.142	0.621	0.33	1.17
6	Lower Socio-economic Status	0.885	0.003	2.423	1.36	4.32

When RANDS score was removed from the model, consumption by other family members emerged as a significant risk factor ($p=0.014$) with odds (95% C.I.) of 2.04 (1.15 – 3.60) times higher for becoming a problem drinker. The change in the B-coefficient value for consumption of alcohol by parents between the two multivariate models was more than 10%, thereby showing that the effect of alcohol use by parents on problem drinking was confounded by the attitude towards non-drinkers. So the 2 models showed that the attitude developed by the young people towards non-drinkers is the significant independent factor that would influence alcohol use rather than the actual use by the parents and other family members. Consumption by friends remained as the strongest risk factor ($p<0.001$).

6 DISCUSSION

There has been a steady up rise in the production and procurement of alcohol worldwide over the past two decades (2), (3). In India, according to NFHS 3 data, the prevalence of alcohol use among men has been estimated to be 32%, which is nearly one third of the population. Alcohol has been recognized as a risk factor for not only ill-health but also as a detrimental agent for social welfare and growth. It poses as an economic burden on the society (132). The issues related to alcohol consumption that that has been influential in the paradigm of practice is earlier age at initiation, greater licitness of social drinking, quantum of consumption, patterns of usage and popularity amongst users.

In this research, we decided to conduct a cross-sectional examination of the patterns and correlates of alcohol usage in young people between 20 to 35 years in a rural developmental block of Tamil Nadu. The commonly described contributing factors from previous studies like unsupervised drinking (11), (15), (17), peer pressure (7), (12), (14), (15), (16), (61), (69), (70), age at first drink (5), (8), (31), (61), (58), amount of alcohol consumed (7), (31), easy availability (8), (57), (60), presence of brewery in the village (12), smoking (32), (35), (129), poor education and lower socioeconomic status (32), (45), (57), (58), (59), (60) were studied along with additional factors like alcohol use by parents and other family members, involvement in non-work related activity and attitude towards non-drinkers. The study was not only powered to analyze the possible risk factors, but also to assess the prevalence of alcohol use and abuse in a rural community.

In the Indian societal scenario, parents assume a significant role in controlling the activities of adolescents till they complete high school and sometimes this act extends upto college life. Usually in the early twenties, individuals breathe an air of freedom and the quality of experimentation of its boundaries is tested. We were interested in evaluating the proportion of individuals who misused this newly vested attribute; hence we chose our study population as males who were within the age limits of 20 years and 35 years. An evaluation of the age distribution of the randomly chosen participants showed a nearly uniform spread within the specified boundary of age category chosen. Thirty cluster villages from K.V. Kuppam rural developmental Block of Vellore district, Tamil Nadu was randomly chosen to be studied and giving provision for taking care of the design effect of 2 i.e. inter-cluster and intra-cluster variability, 300 participants were studied with 10 participants chosen from each of the 30 cluster villages.

Analysis of the characteristics of the participants gave us an insight to the structural make-up and the practices prevalent in this block. It was observed that nearly one quarter of the participants (26.7%) had no formal education or were educated upto primary school level only. Nearly two-fifths of the participants (39.3%) had education upto secondary school level and had discontinued thereafter. It was intriguing to note that in a rural setting, 34% of the participants had pursued at least a diploma / graduation degree course after completion of high school. This draws our attention to the fact that awareness regarding need for higher education stands out even in a rural population where a quarter of them are poorly educated.

Even after 67 years of India's independence, the caste system of categorization of individuals is ubiquitous. From our results, people belonging to scheduled, backward and most backward castes comprised 97% of the study group. A reflection of utilization of opportunities provided by the government in terms of reservation, preference for backward castes in jobs and promotion of modes of self sustainability was evident by the fact that 97.8% of people had a steady source of income amongst those expected to be involved in monetarily gainful activity. On the flipside of this observation, it was noted that nearly two-thirds of them (67.6%) were actually involved in unskilled or Class IV skilled occupation, 14% in Class III and only 0.7% in Class I type of occupation. In contrast to the type of occupation, a review of the participants' incomes, disclosed that 71% of them managed to earn more than the minimum wages criteria set forth by the government of Tamil Nadu. This could be indicted as the cause for providing the means for 89.5% of the problem drinkers belonging to Class IV or lesser skilled occupation, which was found to have a statistically significant association with each other.

From several studies done in India, alcohol abuse has been indicated as the causative factor for broken homes, domestic violence and familial disharmony (25), (30), (31), (32), (64), (125), (126), (127). In our study population, in contradistinction to prior trend of early age of marriage, only 40.7% of young adults were married. A bachelor can afford to lead a more carefree life as compared to a married man. The exhilaration of marriage comes with the bounty of added responsibility, duty and financial burden. As we have seen that in the study population 94.6% of married men had fathered a child, it directs us to contemplate what amount of stress rests on the

shoulders of a married man to ensure safety and comfortable living options for his family. There is some degree of disharmony in every family which supplements the stress factor. With the responsibilities and importance endowed upon a man after marriage, certain individuals perceive newer boundaries of maturity and bring alcohol use within its purview. The belief that espousal brings about a change in behavior and greater understanding and realization of responsibilities was not evident from our case control study analysis where, amongst problem drinkers, the proportion of married men was 47.2% as compared to 52.8% single men. The difference in this proportion was not statistically significant (p -value 0.094). An observation of the family structure displayed three fifths of the families (179, 59.7%) to be of nuclear type as compared to joint families (1.3%) and extended families (39%). This was in conjunction to the present norm of disintegration of larger families into smaller nuclear families, which has penetrated even the rural setting.

In a study conducted by Mohan et al, they observed that there was a steady rise in the number of people using alcohol as the age increased, with the maximal number of alcohol consumers being in the thirty year age bracket (34). In another study conducted by N. Girish et al, it was noted that 67.4% belonged to 26–45 years age group. When we evaluated our study population, it revealed that there was a steady rise in alcohol usage as the age increased, the percentages of which are as follows: in the age group 20-24 years 38.38% consumed alcohol, in 25-29 years age group 54.0% used alcohol and in 30-35 years age group the percentage of individuals consuming alcohol was 56.44%. This observed pattern was in conformity to the pattern of alcohol consumption described in other Indian study groups. Among

alcohol abusers (AUDIT score ≥ 8), age for maximal amount of misuse of alcohol was 25 – 28 years, after which a decline of 6% of hazardous alcohol use was noted. When we compared the mean age among problem drinkers and non-drinkers/non-problem drinkers, no significant difference was noted. According to a study done in urban Kolkata, the mean age of initiation of alcohol consumption was 20.8 years. In our study of the rural population, the results showed a similar trend with the mean age (SD) at first drink being 21.62 (3.61) years. The most common age at which consumption of alcohol was initiated was 20 years. We proposed that hazardous drinkers were more likely to have started using alcohol at an earlier age and the strong association observed (p-value 0.045) [OR (95% CI); 1.97 (1.01 – 3.84)] proved our hypothesis.

In contrast to the study conducted by Pillai A et al (9) and other studies regarding the type of alcohol used, where they have found that in rural areas the usual types of alcohol used were locally brewed rice beer (handia), palm wine (tadi), distilled country liquor (chullu), and Indian-made foreign liquor (IMFL) with arrack (35%) being consumed maximally (7), (9), (39); in our study we found that the most commonly used alcoholic beverage was beer (73.8%), followed by IMFL (60.4%) and only a small percentage (2.7%) consumed country liquor. Nearly half of the alcohol users consumed both beer and IMFL (49.04%). Admission to use of locally brewed alcohol was minimal as none of the villages reported to have an illicit brewery. It was also highlighted in our study that very few people consumed alcohol in the presence of their family members, which is in compliance with the conservative nature of Indian culture and community. Only one-fifth of the alcohol users consumed alcohol at their

own home (20%) and/or in their friend's home (21.5%). A substantial proportion of them (38.9%) also consumed alcohol in retail shops or bars. Majority (73.8%) of the alcohol users consumed alcohol in social gatherings or got together in small or large groups in open spaces in the vicinity of their village. Most of the people consumed alcohol in company of others. Very few people consumed alcohol alone, and when they did, it was usually in their own home. We undertook a qualitative assessment of possible reasons leading to alcohol usage within this rural population. Social factors like alcohol serves as a mode of entertainment, time pass and relaxation and as a means to socialize with friends were the most commonly accounted reasons. Nearly one-third (30%) of the study population resorted to alcohol to gain comfort from depressive mood. Among some people, familial disharmony or work related stress prompted them to use alcohol.

From the participants who were interviewed 35% consumed alcohol on a weekly basis or less frequently, 12% consumed alcohol more than once in a week and 2.7% consumed alcohol more than four times a week. Although 20.7% of the men admitted to occasional episodes of binge drinking over the past one year and 5% admitted to binge drinking every month, the usual amount of alcohol consumption in a quarter of the study population (26.7%) was either a bottle of beer or one quarter of IMFL. Most of the men (46.4%) restricted to drinking either two bottles of beer or two quarters of IMFL. 6.6% of alcohol users needed a morning drink to get them going. One-tenth of the study population gave history of being involved in violence or a brawl following alcohol use, within the past one year. It was interesting to note that the quality of drinking was not supported by the near and dear ones of alcohol users, as nearly

two-fifths (37.6%) of alcohol consumers were advised to quit drinking. Among the participants who indulged in drinking, the mean (95% CI) expenditure on a monthly basis for procuring alcohol was Rs.881.07 (723.18 - 1038.95), which was nearly one-tenth of the mean income of the study population. The maximum expenditure per month recorded was Rs.6000.

Individuals who had consumed alcohol at some of time in their life, irrespective of whether they had indulged in drinking in the past one year, were considered as life time ever users of alcohol. The prevalence of life time ever users of alcohol in this rural study population was 54.3%. The prevalence of current users of alcohol was estimated to be 49.7% of the total population and the prevalence of hazardous alcohol use among the current alcohol users was calculated to be 59.7% and about 30% of the total study participants were problem drinkers. These results were in accord to the prevalence estimated by other authors who have studied different / similar groups of Indian population (5-10,12,13,30,45-47).

In the previously conducted studies, not only in India but also across the globe, the most common attribute to initiation of alcohol usage and problem drinking was the presence of peer pressure(7), (12), (14), (15), (16), (52). In a study done in Ludhiana, peer pressure has been indicted to have a 38% influence on becoming an alcoholic (52). Especially amongst the young generation, peer pressure has been established as a strong risk factor for drinking and has been deemed to be responsible for the paradigm of shift of age at first drink to an earlier age. In the late adolescent age group and among young adults, the offspring of a rebellious nature against parents leads to a deviant attitude and this group of bohemian individuals find solace in the

company of each other. If proper guidance is not rendered to them, the possibility of exploration of vices has no restriction. Frequently, individuals in the gray areas of being undecided as whether to indulge in a certain activity, would rather conform to the abomination of the group than be an outcast. If the factors of compulsion and encouragement by peers are coupled with the attitude of use of alcohol, the likelihood of alcoholism is high. We evaluated peer pressure in two aspects viz. behavior and attitude towards peer pressure and association between problem drinking and peer pressure. Of all the participants studied, 19.3% admitted to being felt left out when their friends gathered in a group to drink and they were not a part of the group; 25.7% disclosed that their friends would make fun of them if they refused to consume alcohol when they were offered and 13.3% acknowledged the feeling of popularity after alcohol consumption. Nearly half of the problem drinkers were in acceptance of the feeling of longing to join a company of alcohol consumers and agreed that their friends would compel them to drink else they would make fun of them, as compared to 15% and 26.7% of non-problem drinkers for the same respective attitudes. Nearly one third (28.1%) of the problem drinkers felt that their popularity increased if they consumed alcohol. It was also notable that 16 non-drinkers faced situations where their friends have made fun of them if they have refused to partake of alcohol. This is a direct revelation that amongst hazardous drinkers peer pressure plays a strong agonist role. To observe for association between problem drinking and the role of peer pressure we looked at alcohol consumption by friends and compulsion and encouragement provided by friends to use alcohol. Among the group of problem drinkers, 94.4% had friends who consumed

alcohol and 77.5% had friends who compelled and encouraged them to drink. Both these associations were statistically significant ($p < 0.001$) and the odds of becoming a problem drinker was 7.48 (2.90 – 19.31) if friends were consuming alcohol and 6.95 (3.91 – 12.34) if friends encouraged an individual to drink alcohol. This significant magnitude of association for both exposure factors is in clear direct conjunction with the importance of the role of peer pressure in determining the inclination towards problem drinking. In congruence to the results of other studies, peer pressure was implicated to have a high risk of being associated with problem drinkers. When peer pressure was evaluated against the effects of other factors, consumption of alcohol by friends emerged as the strongest risk factor ($p = 0.031$).

Multiple aspects of family life were taken into consideration for determining the outcome of problem drinking. It was assumed that having both parents alive during the early life of an individual, would be a restraining factor in overindulgence of alcohol. But the results of this study were in concurrence with the conclusion from the C-SURF-study conducted by Steiner et al where single parent family structure was not considered to be a risk factor for alcohol abuse (149). There was no significant association between the chance of becoming an alcoholic and both parents being available or only single being available during the early life period. In a study done in Sweden, which looked at antecedent factors for alcohol use, it was noted that children's attitude of tasting alcohol was a reflection of the parental modeling of drinking. Children are usually a representation of their parents as they imbibe the characteristics portrayed before them. The inquisitive and curious nature of humans propels him to experiment the fruit of grape, which has been withheld from him by the

elders, at the earliest opportunity that knocks on his door. In the Indian community scenario, where elder men promote an air of exclusiveness as they sit apart in a group, consuming alcohol and discussing issues, the young feel prompted to embrace this social norm. Young men envisage alcohol consumption a marker of coming of age. As early age of initiation of alcohol has been significantly attributed to problem drinking in an earlier analysis, the proposition that participants whose parents or family members consumed alcohol were at an increased risk of being problem drinkers, was tested. Our results showed that 61.8% of problem drinkers had parents who consumed alcohol and 64% of problem drinkers had other immediate family members who consumed alcohol. A definitive association between alcohol misuse and familial attitude and behavior towards alcohol consumption was established. The odds (95 % CI) of becoming a hazardous drinker was 1.83 (1.10 – 3.04) more among individuals with parents using alcohol and 2.54 (1.52 – 4.24) more among individuals having other immediate family members consuming alcohol. Though in bivariate analysis parents consuming alcohol was significantly associated with problem drinking habit, multivariate analysis showed that it is not an independent risk factor rather it is confounded by attitude of the young people towards non-drinkers. The 2 multivariate models clearly showed that negative attitude towards non-drinkers created by parents and other family members consuming alcohol was the strong independent risk factor for problem drinking and not the actual presence of the parents or other family members consuming alcohol This reiterates the fact that children imbibe whatever they observe and embrace the attitudes and practices of their parents. This brings us to contemplate a different approach to controlling

alcoholism in a society, i.e. by bringing about awareness and creating a positive attitude towards non-drinking among the youth.

It was propounded that men from lower middle class had proclivity to alcoholism because of the poor education, financial instability, poor understanding of social issues, poorer living conditions and lack of entertainment and pass-time. Lower socio-economic status was found to be significantly associated ($p < 0.001$) with problem drinking with an OR (95% C.I) of 2.63 (1.54 – 4.50) in the bivariate analysis. After adjusting for the effect of all the potential confounders in 2 models, poor socioeconomic status emerged as one of the independent risk factor for problem drinking ($p = 0.06$ in full model and $.003$ in model without RANDS score), and it was confounded by attitude towards non-drinkers.

The results of a study conducted in Cardiff, UK by Hallinberg B et al, where they compared the impact of participation in organized sports on hazardous drinking, showed that involvement in any form of team sports was significantly associated with less hazardous drinking (78). In India, because of inadequate facilities and opportunities for organized sports in the rural setting, our posit was – involvement in non-work related activities like games, stage performances, participation in cultural events and social events and contributing physical help during festivities would lessen the availability of wasteful leisure time, keep an individual engaged and hence would not promote the vice of drinking. Understanding of social issues and an extrovert nature would prompt an individual to make substantial use of his free time by engaging in meaningful activities and being enterprising. Amongst problem drinkers only 34.8% were involved in some form of non-work related activity, as

compared to 45% among non-drinkers/ non-problem drinkers. Even though this association did not turn out to be significant at the 5% level, it did seem to reduce the problem of harmful use of alcohol ($p=0.102$) [OR (95% C.I)] [0.65 (0.391 – 1.09)]. If more organized events are promoted and involvement of young adults is ensured, it is hoped that there would be a reduction in problem drinking by nearly 35% which would have a positive influence on the community.

Daniel Regan from Ireland, developed a new tool for the assessment of attitude towards non-drinking because the results from previous studies had shown that a proportion of people conformed to the act of consuming alcohol only because they wanted to avoid social ostracism (19). Their proposition was that if individuals had the inherent positive attitude towards non-drinker, then they themselves would refrain from indulging in alcoholism, irrespective of other adverse factors like peer pressure. The newly devised tool had eleven items, the responses of each of which were graded on a five point Likert format. Each item evaluated the attitude of the responder towards non-drinkers. The Likert scale of response ranged from “strongly disagree”, which was scored as 1 up to “strongly agree”, which was coded as 5. The total scores ranged between 0 – 55. There is no categorical division of the RANDS score to classify the outcome. According to the authors, the mean RANDS score was to be assessed. Higher the mean RANDS score, the lesser was the predilection towards alcohol usage. We classified the total study group (N=300), into three groups of non-drinkers, non-problem drinkers and problem drinkers and compared the mean RANDS score in each group. The highest mean RANDS score was assessed to be amongst non-drinkers (39.44) and the lowest was observed in the problem drinking group (31.13). We reclassified the study

population into cases and controls with 89 participants in each group. The mean score among cases was 31.13 and among controls were 38.61. Since it was a continuous variable, an independent t-Test was performed and the association between the RANDS score and the outcome of problem drinking was significantly associated with the Mean difference (95% CI) [-7.05 (-8.13 to -5.97)]. RANDS was the only other factor which showed to have a strong preventive effect against alcohol abuse. A binary logistic regression analysis was performed to evaluate the effect of RANDS score on the outcome of hazardous drinking, taking into consideration the modifying effects of all the other factors. It was found that RANDS score emerged as a strong preventive factor, irrespective of the influence of other factors. This demonstrates that individuals, who had high scores, did not deem it worthwhile to indulge in alcohol. People who were already classified as problem drinkers scored the least on this questionnaire. The implication of this result is – if people have the inherent quality of aversion to alcohol and/or have a positive attitude towards non-consumers, they are more likely to abstain from alcohol use, irrespective of negative influence surrounding them.

7 CONCLUSION AND RECOMMENDATIONS

In this study of 300 young adult males aged between 20-35years, belonging to a rural developmental block of Tamil Nadu, the observed prevalence of life time use of alcohol was 54.3% and the prevalence of current use of alcohol was 49.7%. Among the alcohol users, the proportion of problem drinkers was found to be 59.7%. The youngest age for initiation of alcohol use was reported to be 12years, with the most common age of initiation being 20years. The outcome of problem drinking was significantly associated with a lower age of initiation of alcohol consumption among the alcohol users. The maximum number of problem drinkers was observed to be in the 25-29year age bracket, and thereafter a decline of 12% was observed in the number of problem drinkers. Patterns of frequent consumption and binge drinking were also noted in this study group. The most preferred type of alcohol was beer followed by IMFL, with a substantial proportion of them consuming both. Only 2.7% reported the use of country liquor. The most common locations for consuming alcohol were open spaces like fields, road-side areas, construction sites, etc followed by drinking in a bar.

Analyses of the proposed risk factors for problem drinking reveal that lower socio-economic status, parents or other family members consuming alcohol and peer pressure/peer influence have significant associations with the outcome. A positive attitude towards non-drinkers was found to prevent a significant proportion of young adults from becoming problem drinkers. Among all the risk factors, peer influence was found to be independently associated with the outcome of problem drinking and attitude towards non-drinkers was found to be independently preventive against

problem drinking. From the analysis of the combined risk factors, it was evident that the independent effect of attitude towards non-drinkers was more important in determining the outcome of becoming a problem drinker, rather than the actual presence of parents or other family members consuming alcohol.

These observations lead us to conclude the need for effective behavioural, attitude and cultural modifying interventions, which can help in decreasing the burden of alcoholism. Better alcohol prevention policies, control of propagation of alcohol use by media, increased and better employment opportunities, facilities and provision for involvement in recreational activities and health education for awareness will undoubtedly bring about a sea change in the present alcohol scenario.

8 BIBLIOGRAPHY

1. WHO technical report series no.7:650. Problems related to alcohol consumption. Geneva: World Health Organization; 1980. World Health Organization.
2. World Health Organization. Global status report: alcohol policy. Geneva: Department of Mental Health and Substance Abuse. World Health Organization; 2004.
3. Indian Alcohol Policy Alliance. 2009 Mar.
4. National survey on extent, pattern and trends of drug abuse in India. 2004.
5. Ghosh S, Samanta A, Mukherjee S. Patterns of alcohol consumption among male adults at a slum in Kolkata, India. *J Health Popul Nutr.* 2012 Mar;30(1):73–81.
6. WHO Expert Committee. Problems Related to Alcohol Consumption. Geneva; 2006 Oct.
7. Girish N, Kavita R, Gururaj G, Benegal V. Alcohol use and implications for public health: patterns of use in four communities. *Indian J Community Med Off Publ Indian Assoc Prev Soc Med.* 2010 Apr;35(2):238–44.
8. Johnson PR, Banu S, Ashok MV. Severity of alcoholism in Indian males: Correlation with age of onset and family history of alcoholism. *Indian J Psychiatry.* 2010 Jul;52(3):243–9.
9. Pillai A, Nayak MB, Greenfield TK, Bond JC, Nadkarni A, Patel V. Patterns of alcohol use, their correlates, and impact in male drinkers: a population-based survey from Goa, India. *Soc Psychiatry Psychiatr Epidemiol [Internet].* 2012 Jul 3 [cited 2012 Sep 21]; Available from: <http://www.ncbi.nlm.nih.gov/pubmed/22752108>
10. D'Costa G, Nazareth I, Naik D, Vaidya R, Levy G, Patel V, et al. Harmful alcohol use in Goa, India, and its associations with violence: a study in primary care. *Alcohol Oxf.* 2007 Apr;42(2):131–7.
11. Ferreira MM da SR dos S, Torgal MCL de FPR. Tobacco and Alcohol Consumption among Adolescents. *Rev Lat Am Enfermagem.* 2010 Apr;18(2):255–61.
12. John A, Barman A, Bal D, Chandy G, Samuel J, Thokchom M, et al. Hazardous alcohol use in rural southern India: nature, prevalence and risk factors. *Natl Med J India.* 2009 Jun;22(3):123–5.
13. Kumar S G, Vinayagamoorthy , Kumar V. Prevalence and Pattern of Alcohol Consumption using Alcohol Use Disorders Identification Test (AUDIT) in Rural Tamil Nadu, India. *J Clin Diagn Res JCDR.* 2013 Aug;7(8):1637–9.
14. Jamison J, Myers LB. Peer-group and price influence students drinking along with planned behaviour. *Alcohol Oxf.* 2008 Aug;43(4):492–7.

15. Ryan SM, Jorm AF, Kelly CM, Hart LM, Morgan AJ, Lubman DI. Parenting strategies for reducing adolescent alcohol use: a Delphi consensus study. *BMC Public Health*. 2011;11:13.
16. Bellis MA, Morleo M, Hughes K, Downing J, Wood S, Smallthwaite L, et al. A cross-sectional survey of compliance with national guidance for alcohol consumption by children: measuring risk factors, protective factors and social norms for excessive and unsupervised drinking. *BMC Public Health*. 2010;10:547.
17. Kiuru N, Burk WJ, Laursen B, Salmela-Aro K, Nurmi J-E. Pressure to drink but not to smoke: disentangling selection and socialization in adolescent peer networks and peer groups. *J Adolesc*. 2010 Dec;33(6):801–12.
18. Regan D, Morrison TG. Adolescents' negative attitudes towards non-drinkers: a novel predictor of risky drinking. *J Health Psychol*. 2013 Nov;18(11):1465–77.
19. Regan D, Morrison TG. Development and validation of a scale measuring attitudes toward non-drinkers. *Subst Use Misuse*. 2011;46(5):580–90.
20. Das SK, Balakrishnan V, Vasudevan DM. Alcohol: its health and social impact in India. *Natl Med J India*. 2006 Apr;19(2):94–9.
21. Ganaraja B, Ramesh BM, Kotian MS. A comparison of responses to alcohol expectancy questionnaire (CEOA) of Indian and Malaysian medical students. *Indian J Physiol Pharmacol*. 2010 Sep;54(3):265–70.
22. Rassool GH, Winnington J. Adolescents and alcohol misuse. *Nurs Stand R Coll Nurs G B* 1987. 2003 Apr 9;17(30):46–52; quiz 53–5.
23. Saxena S. Alcohol, Europe and the developing countries. *Addict Abingdon Engl*. 1997 Mar;92 Suppl 1:S43–8.
24. Rehm J, Rehn N, Room R, Monteiro M, Gmel G, Jernigan D, et al. The global distribution of average volume of alcohol consumption and patterns of drinking. *Eur Addict Res*. 2003 Oct;9(4):147–56.
25. Lam TH, Chim D. Controlling alcohol-related global health problems. *Asia-Pac J Public Health Asia-Pac Acad Consort Public Health*. 2010 Jul;22(3 Suppl):203S – 208S.
26. Legge C, Sherlock L. Perception of alcohol use and misuse in three ethnic communities: implications for prevention programming. *Int J Addict*. 1990 1991;25(5A-6A):629–53.
27. Johansson E, Böckerman P, Prättälä R, Uutela A. Alcohol-related mortality, drinking behavior, and business cycles: are slumps really dry seasons? *Eur J Health Econ HEPAC Health Econ Prev Care*. 2006 Sep;7(3):215–20.
28. Crombie IK, Irvine L, Elliott L, Wallace H. How do public health policies tackle alcohol-related harm: a review of 12 developed countries. *Alcohol Oxf*. 2007 Oct;42(5):492–9.

29. Sharma HK, Tripathi BM, Peltó PJ. The evolution of alcohol use in India. *AIDS Behav.* 2010 Aug;14 Suppl 1:S8–17.
30. Benegal V. India: alcohol and public health. *Addiction.* 2005 Aug 1;100(8):1051–6.
31. Prasad R. Alcohol use on the rise in India. *Lancet.* 2009 Jan 3;373(9657):17–8.
32. Jacob KS. Alcohol and public health policies in India. *Natl Med J India.* 2010 Aug;23(4):224–5.
33. Mohindra KS, Narayana D, Anushreedha SS, Haddad S. Alcohol use and its consequences in South India: views from a marginalised tribal population. *Drug Alcohol Depend.* 2011 Aug 1;117(1):70–3.
34. Mohan D, Sundaram KR, Advani GB, Sharma HK, Bajaj JS. Alcohol abuse in a rural community in India. Part II: characteristics of alcohol users. *Drug Alcohol Depend.* 1984 Oct;14(2):121–8.
35. Neufeld KJ, Peters DH, Rani M, Bonu S, Brooner RK. Regular use of alcohol and tobacco in India and its association with age, gender, and poverty. *Drug Alcohol Depend.* 2005 Mar 7;77(3):283–91.
36. Tripathi BM, Lal R. Substance abuse in children and adolescents. *Indian J Pediatr.* 1999 Aug;66(4):569–75.
37. George A, Varghese C, Sankaranarayanan R, Nair MK. Use of tobacco and alcoholic beverages by children and teenagers in a low-income coastal community in south India. *J Cancer Educ Off J Am Assoc Cancer Educ.* 1994;9(2):111–3.
38. Potukuchi PS, Rao PG. Problem alcohol drinking in rural women of Telangana region, Andhra Pradesh. *Indian J Psychiatry.* 2010 Oct;52(4):339–43.
39. Chowdhury AN, Ramakrishna J, Chakraborty AK, Weiss MG. Cultural context and impact of alcohol use in the Sundarban Delta, West Bengal, India. *Soc Sci Med* 1982. 2006 Aug;63(3):722–31.
40. Nayak MB, Kerr W, Greenfield TK, Pillai A. Not all drinks are created equal: implications for alcohol assessment in India. *Alcohol Oxf.* 2008 Dec;43(6):713–8.
41. Nimmagadda J. A pilot study of the social construction of the meanings attached to alcohol use: perceptions from India. *Subst Use Misuse.* 1999 Jan;34(2):251–67.
42. Singh SK, Schensul JJ, Gupta K, Maharana B, Kremelberg D, Berg M. Determinants of alcohol use, risky sexual behavior and sexual health problems among men in low income communities of Mumbai, India. *AIDS Behav.* 2010 Aug;14 Suppl 1:S48–60.
43. Mani MK. Bottoms up. *Natl Med J India.* 2003 Dec;16(6):331–2.
44. Gupta PC, Saxena S, Pednekar MS, Maulik PK. Alcohol consumption among middle-aged and elderly men: a community study from western India. *Alcohol Alcohol Oxf Oxf.* 2003 Aug;38(4):327–31.

45. Medhi GK, Hazarika NC, Mahanta J. Correlates of alcohol consumption and tobacco use among tea industry workers of Assam. *Subst Use Misuse*. 2006;41(5):691–706.
46. Nayak MB, Korcha RA, Benegal V. Alcohol use, mental health, and HIV-related risk behaviors among adult men in Karnataka. *AIDS Behav*. 2010 Aug;14 Suppl 1:S61–73.
47. Mohan D, Sundaram KR, Sharma HK. A study of drug abuse in rural areas of Punjab (India). *Drug Alcohol Depend*. 1986 May;17(1):57–66.
48. Kim S, Rifkin S, John SM, Jacob KS. Nature, prevalence and risk factors of alcohol use in an urban slum of Southern India. *Natl Med J India*. 2013 Aug;26(4):203–9.
49. Sinha DN, Gupta PC, Pednekar MS. Prevalence of smoking and drinking among students in north-eastern India. *Natl Med J India*. 2003 Feb;16(1):49–50.
50. Tsering D, Pal R, Dasgupta A. Licit and illicit substance use by adolescent students in eastern India: Prevalence and associated risk factors. *J Neurosci Rural Pract*. 2010 Jul;1(2):76–81.
51. Garg A, Chavan BS, Singh GP, Bansal E. Patterns of alcohol consumption in medical students. *J Indian Med Assoc*. 2009 Mar;107(3):151–2, 154–5.
52. Khosla V, Thankappan KR, Mini GK, Sarma PS. Prevalence & predictors of alcohol use among college students in Ludhiana, Punjab, India. *Indian J Med Res*. 2008 Jul;128(1):79–81.
53. Sri EV, Raguram R, Srivastava M. Alcohol problems in a general hospital--a prevalence study. *J Indian Med Assoc*. 1997 Sep;95(9):505–6.
54. Madhivanan P, Hernandez A, Gogate A, Stein E, Gregorich S, Setia M, et al. Alcohol use by men is a risk factor for the acquisition of sexually transmitted infections and human immunodeficiency virus from female sex workers in Mumbai, India. *Sex Transm Dis*. 2005 Nov;32(11):685–90.
55. Heravian A, Solomon R, Krishnan G, Vasudevan CK, Krishnan AK, Osmand T, et al. Alcohol consumption patterns and sexual risk behavior among female sex workers in two South Indian communities. *Int J Drug Policy* [Internet]. 2012 May 17 [cited 2012 Sep 21]; Available from: <http://www.ncbi.nlm.nih.gov/pubmed/22608567>
56. Samet JH, Pace CA, Cheng DM, Coleman S, Bridden C, Pardesi M, et al. Alcohol use and sex risk behaviors among HIV-infected female sex workers (FSWs) and HIV-infected male clients of FSWs in India. *AIDS Behav*. 2010 Aug;14 Suppl 1:S74–83.
57. Sundaram KR, Mohan D, Advani GB, Sharma HK, Bajaj JS. Alcohol abuse in a rural community in India. Part I: Epidemiological study. *Drug Alcohol Depend*. 1984 Sep;14(1):27–36.
58. Subramanian SV, Nandy S, Irving M, Gordon D, Davey Smith G. Role of socioeconomic markers and state prohibition policy in predicting alcohol consumption among men and women in India: a multilevel statistical analysis. *Bull World Health Organ*. 2005 Nov;83(11):829–36.

59. Kurian S, Kuruvilla A, Jacob KS. Local and illicit alcohol in India. *Natl Med J India*. 2006 Oct;19(5):296.
60. Nattala P, Leung KS, Nagarajaiah, Murthy P. Family member involvement in relapse prevention improves alcohol dependence outcomes: a prospective study at an addiction treatment facility in India. *J Stud Alcohol Drugs*. 2010 Jul;71(4):581–7.
61. Donovan JE, Molina BSG. Antecedent Predictors of Children’s Initiation of Sipping/Tasting Alcohol. *Alcohol Clin Exp Res*. 2014 Aug 1;n/a – n/a.
62. Amundsen EJ, Rossow I, Skurtveit S. Drinking pattern among adolescents with immigrant and Norwegian backgrounds: a two-way influence? *Addict Abingdon Engl*. 2005 Oct;100(10):1453–63.
63. Gupta PC, Maulik PK, Pednekar MS, Saxena S. Concurrent alcohol and tobacco use among a middle-aged and elderly population in Mumbai. *Natl Med J India*. 2005 Apr;18(2):88–91.
64. Poulouse B, Srinivasan K. High risk behaviours following alcohol use in alcohol dependent men. *Indian J Med Res*. 2009 Apr;129(4):376–81.
65. Mattoo SK, Singh SM. High risk behaviours & alcohol dependence. *Indian J Med Res*. 2009 Apr;129(4):354–6.
66. Chandra PS, Krishna VAS, Benegal V, Ramakrishna J. High-risk sexual behaviour & sensation seeking among heavy alcohol users. *Indian J Med Res*. 2003 Feb;117:88–92.
67. Varma VK, Basu D, Malhotra A, Sharma A, Mattoo SK. Correlates of early- and late-onset alcohol dependence. *Addict Behav*. 1994 Dec;19(6):609–19.
68. Mimiaga MJ, Thomas B, Mayer KH, Reisner SL, Menon S, Swaminathan S, et al. Alcohol use and HIV sexual risk among MSM in Chennai, India. *Int J STD AIDS*. 2011 Mar;22(3):121–5.
69. Heim D, Hunter SC, Ross AJ, Bakshi N, Davies JB, Flatley KJ, et al. Alcohol consumption, perceptions of community responses and attitudes to service provision: results from a survey of Indian, Chinese and Pakistani young people in Greater Glasgow, Scotland, UK. *Alcohol Alcohol Oxf Oxf*. 2004 Jun;39(3):220–6.
70. Kumar S, Pokharel B, Nagesh S, Yadav BK. Alcohol use among physicians in a medical school in Nepal. *Kathmandu Univ Med J KUMJ*. 2006 Dec;4(4):460–4.
71. Yamashita I, Ohmori T, Koyama T, Mori H, Boyadjive S, Kielholz P, et al. Biological study of alcohol dependence syndrome with reference to ethnic difference: report of a WHO Collaborative Study. *Jpn J Psychiatry Neurol*. 1990 Mar;44(1):79–84.
72. Ray R, Chugh G. Portrayal of alcohol consumption in films- does it influence? *Addict Abingdon Engl*. 2008 Dec;103(12):1933–4; discussion 1937–8.

73. Casswell S. Does alcohol advertising have an impact on the public health? *Drug Alcohol Rev.* 1995;14(4):395–403.
74. Tripathi BM, Sharma HK, Pelto PJ, Tripathi S. Ethnographic mapping of alcohol use and risk behaviors in Delhi. *AIDS Behav.* 2010 Aug;14 Suppl 1:S94–103.
75. Olafsdóttir H, Raitasalo K, Greenfield TK, Allamani A. Concern about family members' drinking and cultural consistency: A Multi-Country GENACIS Study. *Contemp Drug Probl.* 2009 Apr 1;36(1):1.
76. Holmila M, Raitasalo K, Knibbe R, Selin K. Country variations in family members' informal pressure to drink less. *Contemp Drug Probl.* 2009 Apr 1;36(1/2):nihpa126808.
77. Van Hoof JJ, Gosselt JF, de Jong MDT. Determinants of parental support for governmental alcohol control policies. *Health Policy Amst Neth.* 2010 Oct;97(2-3):195–201.
78. Hallingberg B, Moore S, Morgan J, Bowen K, van Goozen SHM. Adolescent male hazardous drinking and participation in organized activities: Involvement in team sports is associated with less hazardous drinking in young offenders. *Crim Behav Ment Health CBMH.* 2014 May 16;
79. Thomas F. Babor, John C. Higgins-Biddle, John B. Saunders, Maristela G. Monteiro. The Alcohol Use Disorders Identification Test Guidelines for Use in Primary Care [Internet]. World Health Organization (WHO); 2001. Available from: http://www.talkingalcohol.com/files/pdfs/WHO_audit.pdf
80. Das SK, Dhanya L, Vasudevan DM. Biomarkers of alcoholism: an updated review. *Scand J Clin Lab Invest.* 2008;68(2):81–92.
81. The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST): development, reliability and feasibility. *Addict Abingdon Engl.* 2002 Sep;97(9):1183–94.
82. Greenfield TK, Nayak MB, Bond J, Patel V, Trocki K, Pillai A. Validating alcohol use measures among male drinkers in Goa: implications for research on alcohol, sexual risk, and HIV in India. *AIDS Behav.* 2010 Aug;14 Suppl 1:S84–93.
83. Mukherjee S, Das SK, Vaidyanathan K, Vasudevan DM. Consequences of alcohol consumption on neurotransmitters -an overview. *Curr Neurovasc Res.* 2008 Nov;5(4):266–72.
84. Saraswat N, Ranjan S, Ram D. Set-shifting and selective attentional impairment in alcoholism and its relation with drinking variables. *Indian J Psychiatry.* 2006 Jan;48(1):47–51.
85. Chopra K, Tiwari V. Alcoholic neuropathy: possible mechanisms and future treatment possibilities. *Br J Clin Pharmacol.* 2012 Mar;73(3):348–62.
86. Arackal BS, Benegal V. Prevalence of sexual dysfunction in male subjects with alcohol dependence. *Indian J Psychiatry.* 2007 Apr;49(2):109–12.

87. Muthusami KR, Chinnaswamy P. Effect of chronic alcoholism on male fertility hormones and semen quality. *Fertil Steril*. 2005 Oct;84(4):919–24.
88. Gaur DS, Talekar MS, Pathak VP. Alcohol intake and cigarette smoking: impact of two major lifestyle factors on male fertility. *Indian J Pathol Microbiol*. 2010 Mar;53(1):35–40.
89. Verma RK, Panda NK, Basu D, Raghunathan M. Audiovestibular dysfunction in alcohol dependence. Are we worried? *Am J Otolaryngol*. 2006 Aug;27(4):225–8.
90. Gupta R, Sharma S, Gupta VP, Gupta KD. Smoking and alcohol intake in a rural Indian population and correlation with hypertension and coronary heart disease prevalence. *J Assoc Physicians India*. 1995 Apr;43(4):253–8.
91. Roy A, Prabhakaran D, Jeemon P, Thankappan KR, Mohan V, Ramakrishnan L, et al. Impact of alcohol on coronary heart disease in Indian men. *Atherosclerosis*. 2010 Jun;210(2):531–5.
92. Ahlawat S, Siwach SB, Jagdish. Indirect assessment of acute effects of ethyl alcohol on coronary circulation in patients with chronic stable angina. *Int J Cardiol*. 1991 Dec;33(3):385–91.
93. Sucharita S, Clark R, Sreedaran P, Srinivasan K. Assessing heart rate variability using a 12 lead ECG in patients with alcohol dependence syndrome. *Indian Pacing Electrophysiol J*. 2009;9(1):53–5.
94. Ahlawat SK, Siwach SB. Alcohol and coronary artery disease. *Int J Cardiol*. 1994 Apr;44(2):157–62.
95. Dey AB, Choudhury D. How frequent and how much alcohol prevents heart attack? *Natl Med J India*. 1997 Dec;10(6):284–5.
96. Gupta R, Jain BK, Nag AK. Influence of alcohol intake on high density lipoprotein cholesterol levels in middle-aged men. *Indian Heart J*. 1994 Jun;46(3):145–9.
97. Vasisht S, Pant MC, Srivastava LM. Effect of alcohol on serum lipids & lipoproteins in male drinkers. *Indian J Med Res*. 1992 Dec;96:333–7.
98. Das SK, Mukherjee S. Long term ethanol consumption leads to lung tissue oxidative stress and injury. *Oxid Med Cell Longev*. 2010 Dec;3(6):414–20.
99. Lalitha T, Kumar K, Ramakrishnan CV, Telang SD. Effect of maternal alcohol consumption on the lipid composition of CNS in the offspring. *J Neurochem*. 1988 May;50(5):1346–51.
100. Chaudhuri JD. An analysis of the teratogenic effects that could possibly be due to alcohol consumption by pregnant mothers. *Indian J Med Sci*. 2000 Oct;54(10):425–31.
101. Maturu P, Reddy VD,. Ethanol induced adaptive changes in blood for the pathological and toxicological effects of chronic ethanol consumption in humans. *Exp Toxicol Pathol Off J Ges Toxikol Pathol*. 2011 Jan 29

102. Das SK, Mukherjee S, Vasudevan DM. Effects of long-term ethanol consumption on adhesion molecules in liver. *Indian J Exp Biol.* 2010 Apr;48(4):394–401.
103. Venkat KK, Arora MM, Singh P, Desai M, Khatkhatay I. Effect of alcohol consumption on bone mineral density and hormonal parameters in physically active male soldiers. *Bone.* 2009 Sep;45(3):449–54.
104. Rai DV, Kumar G, Tewari P, Saxena DC. Acute and chronic dose of alcohol affect the load carrying capacity of long bone in rats. *J Biomech.* 2008;41(1):20–4.
105. Shanmugam KR, Mallikarjuna K, Reddy KS. Effect of alcohol on blood glucose and antioxidant enzymes in the liver and kidney of diabetic rats. *Indian J Pharmacol.* 2011 May;43(3):330–5.
106. Chandrasekaran K, Swaminathan K, Mathan Kumar S, Clemens DL, Dey A. In vitro evidence for chronic alcohol and high glucose mediated increased oxidative stress and hepatotoxicity. *Alcohol Clin Exp Res.* 2012 Jun;36(6):1004–12.
107. Muthukumar T, Jha V, Sud A, Wanchoo A, Bambery P, Sakhuja V. Acute renal failure due to nontraumatic rhabdomyolysis following binge drinking. *Ren Fail.* 1999 Sep;21(5):545–9.
108. Rao DN, Desai PB, Ganesh B. Alcohol as an additional risk factor in laryngopharyngeal cancer in Mumbai--a case-control study. *Cancer Detect Prev.* 1999;23(1):37–44.
109. Notani PN. Role of alcohol in cancers of the upper alimentary tract: use of models in risk assessment. *J Epidemiol Community Health.* 1988 Jun;42(2):187–92.
110. Cancela M de C, Ramadas K, Fayette J-M, Thomas G, Muwonge R, Chapuis F, et al. Alcohol intake and oral cavity cancer risk among men in a prospective study in Kerala, India. *Community Dent Oral Epidemiol.* 2009 Aug;37(4):342–9.
111. Zariwala MB, Lalitha VS, Bhide SV. Carcinogenic potential of Indian alcoholic beverage (country liquor). *Indian J Exp Biol.* 1991 Aug;29(8):738–43.
112. Hashibe M, Sankaranarayanan R, Thomas G, Kuruvilla B, Mathew B, Somanathan T, et al. Body mass index, tobacco chewing, alcohol drinking and the risk of oral submucous fibrosis in Kerala, India. *Cancer Causes Control CCC.* 2002 Feb;13(1):55–64.
113. Narawane NM, Bhatia S, Abraham P, Sanghani S, Sawant SS. Consumption of “country liquor” and its relation to alcoholic liver disease in Mumbai. *J Assoc Physicians India.* 1998 Jun;46(6):510–3.
114. Veena AB, Rajesh G, Varghese J, Sundaram KR, Balakrishnan V. Alcoholic chronic pancreatitis and alcoholic liver cirrhosis: differences in alcohol use habits and patterns in Indian subjects. *Pancreas.* 2012 Jul;41(5):703–6.

115. Makkar RPS, Sachdev GK, Malhotra V. Alcohol consumption, hepatic iron load and the risk of amoebic liver abscess: a case-control study. *Intern Med Tokyo Jpn.* 2003 Aug;42(8):644–9.
116. Glantz MD, Medina Mora ME, Petukhova M. Alcohol abuse in developed and developing countr... *Am J Addict* 2014- PubMed - NCBI. 2013 Aug 29;(2014 Mar;23(2):):145–55.
117. Shafe S, Gilder DA, Montane-Jaime LK, Josephs R, Moore S, Crooks H, et al. Co-morbidity of alcohol dependence and select affective and anxiety disorders among individuals of East Indian and African ancestry in Trinidad and Tobago. *West Indian Med J.* 2009 Mar;58(2):164–72.
118. Trivedi S, Raghavan R. Multi-phasic Questionnaire profile of alcoholics and related factors. *Drug Alcohol Depend.* 1991 Dec;29(1):1–4.
119. Nayak RB, Murthy P. Fetal alcohol spectrum disorder. *Indian Pediatr.* 2008 Dec;45(12):977–83.
120. Raman V, Prasad S, Appaya MP. Children of men with alcohol dependence: Psychopathology, neurodevelopment and family environment. *Indian J Psychiatry.* 2010 Oct;52(4):360–6.
121. Berg MJ, Kremelberg D, Dwivedi P, Verma S, Schensul JJ, Gupta K, et al. The effects of husband's alcohol consumption on married women in three low-income areas of Greater Mumbai. *AIDS Behav.* 2010 Aug;14 Suppl 1:S126–35.
122. Kua EH, Ko SM. Family violence and Asian drinkers. *Forensic Sci Int.* 1991 Aug;50(1):43–6.
123. Cottler LB, Satyanarayana VA, O'Leary CC, Vaddiparti K, Benegal V, Chandra PS. Feasibility and effectiveness of HIV prevention among wives of heavy drinkers in Bangalore, India. *AIDS Behav.* 2010 Aug;14 Suppl 1:S168–76.
124. Schensul SL, Saggurti N, Burleson JA, Singh R. Community-level HIV/STI interventions and their impact on alcohol use in urban poor populations in India. *AIDS Behav.* 2010 Aug;14 Suppl 1:S158–67.
125. Sivaram S, Srikrishnan AK, Latkin C, Iriondo-Perez J, Go VF, Solomon S, et al. Male alcohol use and unprotected sex with non-regular partners: evidence from wine shops in Chennai, India. *Drug Alcohol Depend.* 2008 Apr 1;94(1-3):133–41.
126. Saggurti N, Schensul SL, Singh R. Alcohol use, sexual risk behavior and STIs among married men in Mumbai, India. *AIDS Behav.* 2010 Aug;14 Suppl 1:S40–7.
127. Verma RK, Saggurti N, Singh AK, Swain SN. Alcohol and sexual risk behavior among migrant female sex workers and male workers in districts with high in-migration from four high HIV prevalence states in India. *AIDS Behav.* 2010 Aug;14 Suppl 1:S31–9.

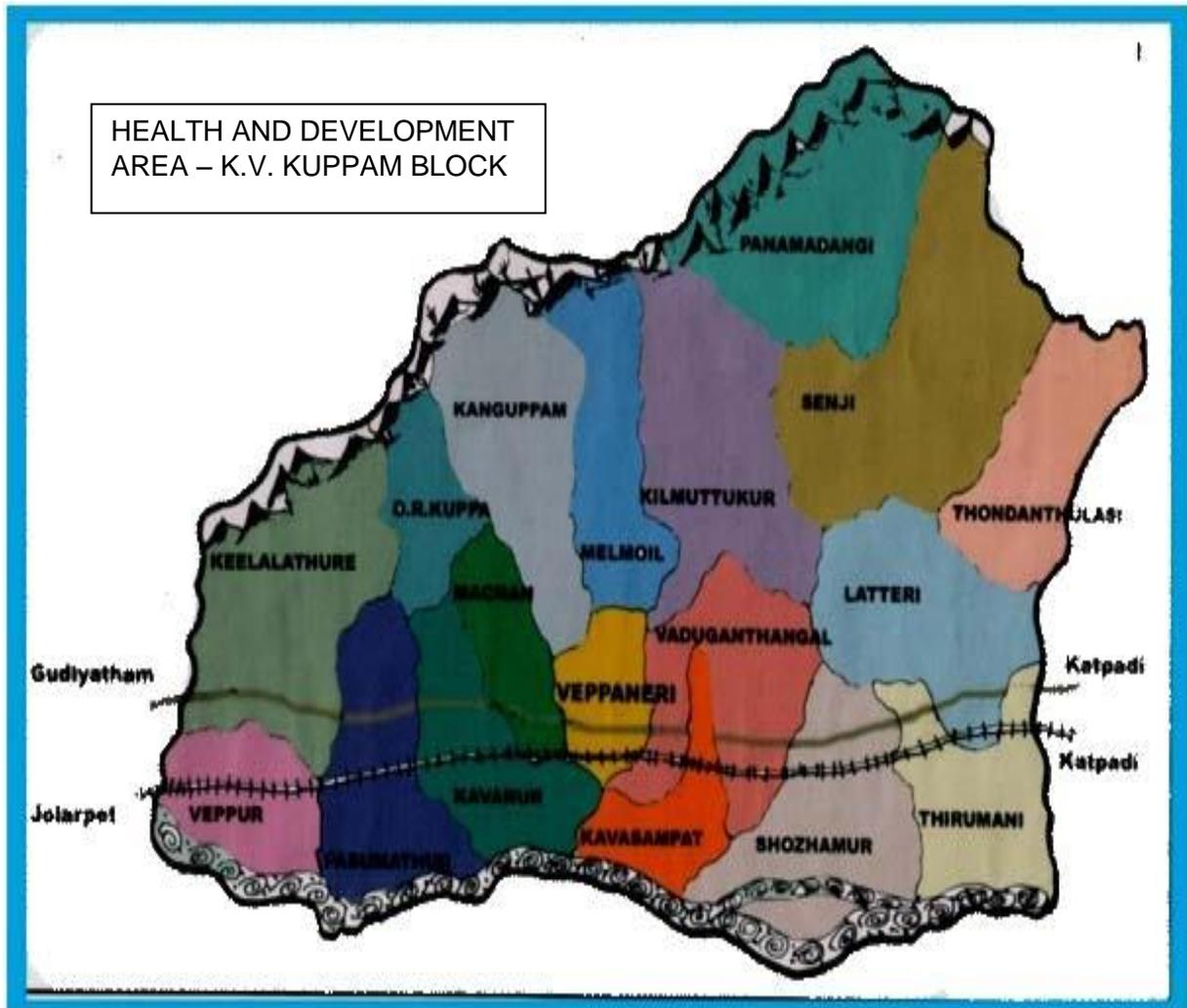
128. Bonu S, Rani M, Peters DH, Jha P, Nguyen SN. Does use of tobacco or alcohol contribute to impoverishment from hospitalization costs in India? *Health Policy Plan*. 2005 Jan;20(1):41–9.
129. Pednekar MS, Sansone G, Gupta PC. Association of alcohol, alcohol and tobacco with mortality: findings from a prospective cohort study in Mumbai (Bombay), India. *Alcohol Fayettev N*. 2012 Mar;46(2):139–46.
130. Bonu S, Rani M, Jha P, Peters DH, Nguyen SN. Household tobacco and alcohol use, and child health: an exploratory study from India. *Health Policy Amst Neth*. 2004 Oct;70(1):67–83.
131. Suhadev M, Thomas BE, Raja Sakthivel M, Murugesan P, Chandrasekaran V, Charles N, et al. Alcohol use disorders (AUD) among tuberculosis patients: a study from Chennai, South India. *PLoS One*. 2011;6(5):e19485.
132. Lehto J. The economics of alcohol. *Addict Abingdon Engl*. 1997 Mar;92 Suppl 1:S55–9.
133. May PA. Alcohol policy considerations for Indian reservations and bordertown communities. *Am Indian Alsk Native Ment Health Res J Natl Cent*. 1992;4(3):5–59; discussion 71–5, 95–100.
134. Pal HR, Yadav D, Mehta S, Mohan I. A comparison of brief intervention versus simple advice for alcohol use disorders in a North India community-based sample followed for 3 months. *Alcohol Alcohol Oxf Oxfs*. 2007 Aug;42(4):328–32.
135. Humeniuk R, Ali R, Babor T, Souza-Formigoni MLO, de Lacerda RB, Ling W, et al. A randomized controlled trial of a brief intervention for illicit drugs linked to the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) in clients recruited from primary health-care settings in four countries. *Addict Abingdon Engl*. 2012 May;107(5):957–66.
136. Pelto PJ, Singh R. Community street theatre as a tool for interventions on alcohol use and other behaviors related to HIV risks. *AIDS Behav*. 2010 Aug;14 Suppl 1:S147–57.
137. Toomey TL, Wagenaar AC. Environmental policies to reduce college drinking: options and research findings. *J Stud Alcohol Suppl*. 2002 Mar;(14):193–205.
138. Colón I, Cutter HS, Jones WC. Alcohol Control Policies, Alcohol Consumption, and Alcoholism. *Am J Drug Alcohol Abuse*. 1981;8(3):347–62.
139. Braillon A, Dubois G. Alcohol control policy: evidence-based medicine versus evidence-based marketing. *Addiction*. 2011 Apr 1;106(4):852–3.
140. Babor TF. Public health science and the global strategy on alcohol. *Bull World Health Organ*. 2010 Sep 1;88(9):643.
141. Anderson P. Global alcohol policy and the alcohol industry. *Curr Opin Psychiatry*. 2009 May;22(3):253–7.

142. Thomas B, Suhadev M, Mani J, Ganapathy BG, Armugam A, Faizunnisha F, et al. Feasibility of an alcohol intervention programme for TB patients with alcohol use disorder (AUD)--a qualitative study from Chennai, South India. *PloS One*. 2011;6(11):e27752.
143. Kuruvilla PK, Jacob KS. Five-year follow up for sobriety in a cohort of men who had attended an Alcoholics Anonymous programme in India. *Natl Med J India*. 2007 Oct;20(5):234–6.
144. Murthy P, Chand P, Harish M, Thennarasu K, Prathima S, Karappuchamy, et al. Outcome of alcohol dependence: the role of continued care. *Indian J Community Med Off Publ Indian Assoc Prev Soc Med*. 2009 Apr;34(2):148–51.
145. De Sousa A, de Sousa A. An open randomized study comparing disulfiram and acamprosate in the treatment of alcohol dependence. *Alcohol Oxf*. 2005 Dec;40(6):545–8.
146. De Sousa AA, De Sousa J, Kapoor H. An open randomized trial comparing disulfiram and topiramate in the treatment of alcohol dependence. *J Subst Abuse Treat*. 2008 Jun;34(4):460–3.
147. De Sousa A, De Sousa A. A one-year pragmatic trial of naltrexone vs disulfiram in the treatment of alcohol dependence. *Alcohol Oxf*. 2004 Dec;39(6):528–31.
148. Global strategy to reduce the harmful use of alcohol. World Health Organization; 2010. Available from: http://www.who.int/substance_abuse/msbalcstragegy.pdf
149. Steiner S, Schori D, Gmel G. Excessive alcohol consumption in young men: is there an association with their earlier family situation? A baseline-analysis of the C-SURF-study (Cohort Study on Substance Use Risk Factors). *Swiss Med Wkly*. 2014;144:w14007.

9 ANNEXURE

MAP OF K.V. KUPPAM BLOCK

FIGURE 28 : MAP OF K.V.KUPPAM BLOCK



PREVALENCE AND CORRELATES OF ALCOHOL CONSUMPTION

RUHSA, COMMUNITY MEDICINE
DEPARTMENT

CHRISTIAN MEDICAL COLLEGE, VELLORE

Check list for recruitment:

Inclusion criteria

- Males
- Age group 20 – 35
- Individuals who give informed consent to be a part of the study

Exclusion criteria

- Any individual with history of mental illness

SERIAL NO. : _____

CODE : _____

Date : _____ / _____ / _____

5. How often during the last year have you failed to do what was normally expected from you because of drinking?

- Never Less than monthly
 Monthly Weekly
 Daily or almost daily

6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?

- Never Less than monthly
 Monthly Weekly
 Daily or almost daily

7. How often during the last year have you had a feeling of guilt or remorse after drinking?

- Never Less than monthly
 Monthly Weekly
 Daily or almost daily

8. How often during the last year have you been unable to remember what happened the night before because you had been drinking?

- Never Less than monthly
 Monthly Weekly
 Daily or almost daily

9. Have you or someone else been injured as a result of your drinking?

- No Yes, but not in the last year
 Yes, during the last year

10. Has a relative or friend or a doctor or another health worker been concerned about your drinking or suggested you cut down?

- No Yes, but not in the last year
 Yes, during the last year

TOTAL AUDIT SCORE = _____

D) CORRELATES QUESTIONNAIRE

1. Early Life Family structure

- Both parents alive Single parent alive
 Family discordance /parents separated Orphan brought up by guardians

2. Does one or both parents consume alcohol ? Yes No
3. Do other family members in the house consume alcohol ? Yes No
4. Do friends consume alcohol ? Yes No
5. Do friends encourage you to consume alcohol ? Yes No
6. Do you feel left out if you do not consume alcohol when your friends are consuming alcohol ? Yes No
7. Do your friends make fun of you if you refuse to consume alcohol ? Yes No
8. Do you feel that your popularity increases if you consume alcohol ? Yes No
9. Do you participate in activities other than those related to work, like sports, stage performances etc ? Yes No
10. Why do you consume alcohol ?

(For non- alcohol consumers : Why do you think others from your village consume alcohol ?)

- For entertainment
 Mode of time pass and relaxation
 Means to socialize and make friends circle
 Reduce Family tension and problems
 Reduce Work/school related problems
 Alleviate depressive mood Death of loved ones
 Presence of chronic illness / debilitating condition
 Social norm
 Others : _____

11. Is there any history of childhood trauma or childhood abuse ? Yes No

E) RANDS QUESTIONNAIRE: TO ASSESS ATTITUDE TOWARDS NON-DRINKERS

1. I would not see there being a problem socially, with myself being a non-drinker
 strongly disagree disagree
 undecided agree
 strongly agree
2. If I were a non-drinker, I believe my friends would treat me differently
 strongly disagree disagree
 undecided agree
 strongly agree
3. I would have just as much success with romantic/sexual partners if I were a non-drinker
 strongly disagree disagree
 undecided agree
 strongly agree
4. I would find it very hard to enjoy my social life if I were a non-drinker
 strongly disagree disagree
 undecided agree
 strongly agree
5. I think being a non-drinker would negatively affect my life
 strongly disagree disagree
 undecided agree
 strongly agree
6. Non-drinkers don't know what fun they're missing
 strongly disagree disagree
 undecided agree
 strongly agree
7. I think it is strange when people of my age(young) do not drink
 strongly disagree disagree
 undecided agree
 strongly agree

8. I would hate to be a non-drinker

- | | |
|--|-----------------------------------|
| <input type="checkbox"/> strongly disagree | <input type="checkbox"/> disagree |
| <input type="checkbox"/> undecided | <input type="checkbox"/> agree |
| <input type="checkbox"/> strongly agree | |

9. Spending time with drinkers is more fun than spending time with non-drinkers

- | | |
|--|-----------------------------------|
| <input type="checkbox"/> strongly disagree | <input type="checkbox"/> disagree |
| <input type="checkbox"/> undecided | <input type="checkbox"/> agree |
| <input type="checkbox"/> strongly agree | |

10. Non-drinkers tend to be repressed

- | | |
|--|-----------------------------------|
| <input type="checkbox"/> strongly disagree | <input type="checkbox"/> disagree |
| <input type="checkbox"/> undecided | <input type="checkbox"/> agree |
| <input type="checkbox"/> strongly agree | |

11. An evening with a non-drinker tends to be predictable and reliable

- | | |
|--|-----------------------------------|
| <input type="checkbox"/> strongly disagree | <input type="checkbox"/> disagree |
| <input type="checkbox"/> undecided | <input type="checkbox"/> agree |
| <input type="checkbox"/> strongly agree | |

TOTAL RANDE SCORE :_____

A Scale for the Assessment of Socio-Economic Status (Updated for 2010).

S.C.Tiwari & Ambrish Kumar

Department of Geriatric Mental Health, CSM Medical University, Lucknow, India

A- HOUSE PROFILE:

URBAN:

A.1- Land Area: (Total area=constructed+unconstructed)

No Land	Up to 600 sq. ft.	601-1200 sq. ft.	1201-1800 sq. ft.	1801-2400 sq. ft.	> 2400 sq. ft.
0	2	4	6	8	10

A.2- House Type:

Not Applicable	K1	P1	P2	P3	P4
0	2	4	6	8	10

Final Score = $\frac{A.1+A.2}{2}$ =

RURAL :

A.1- Land area : (Total area =constructed+ unconstructed)

No Land	Up to 1000 sq. ft.	1001-5000 sq. ft.	5001-10000 sq. ft.	10001-20000 sq. ft.	> 20000 sq. ft.
0	2	4	6	8	10

A.2- House Type:

Not Applicable	K1	P1	P2	P3	P4
0	2	4	6	8	10

K1= Chhappar/hutments

P1= Khaprail /tin shed/ Asbestos shed

P2= R.B. roof

P3= RCC roof

P4 = R.B. or RCC roof with POP

Final Score = $\frac{A.1+A.2}{2}$ =

B - MATERIAL POSSESSION PROFILE :

URBAN :

B.1- House Hold Gadget : (according to the cost of items)

None	Up to ₹15600.00	₹15601.00-78,000.00	₹78,001.00-1,56,000.00	₹1,56,001.00-4,68,000.00	>₹ 4,68,000.00
0	2	4	6	8	10

B.2 Conveyance Facility: (according to the cost of vehicle)

None	Up to ₹ 5000.00	₹5001.00-50,000.00	₹50,001.00-5,00,000.00	₹5,00,001.00-20,00,000.00	>₹ 20,00,000.00
0	2	4	6	8	10

Final Score = $\frac{B.1+B.2}{2}$ =

RURAL:-**B.1- House Hold Gadget: (according to the cost of items)**

None	Up to ₹ 7,800.00	₹7,801.00- 15,600.00	₹15,601.00- 78,000.00	₹78,001.00- 1,56,000.00	>₹1,56,000.00
0	2	4	6	8	10

B.2- Conveyance Facility: (according to the cost of vehicle)

None	Up to ₹ 5000.00	₹5001.00- 50,000.00	₹50,001.00- 5,00,000.00	₹5,00,001.00- 20,00,000.00	>₹ 20,00,000.00
0	2	4	6	8	10

Final Score = $\frac{B.1+B.2}{2}$ =

House Hold Gadget (Average costs in Ra.):

Radio = ₹5,00.00

Two-in-one (Tape +Radio) = ₹ 2,000.00

Digital Camera = ₹10,000.00

Handy Cam = ₹20,000.00

CCTV camera = ₹20,000.00

Electric cooker = ₹2000.00

Colour T.V. (ordinary) = ₹10,000.00

Colour T.V. with T.F.T. screen = ₹20,000.00

L.C.D. T.V. = ₹ 50,000.00

Cooler = ₹5,000.00

Food processor = ₹8000.00

Hand Pump = ₹ 10,000.00

Mixer = ₹5000.00

I-pod = ₹15000.00

Other meaningful gadgets = As applicable

Pet animals = ₹10,000.00

Water Pump (Tulu) = ₹3000.00

O.T.G. (electric) = ₹10,000.00

Computer = ₹25000.00

Geyser = ₹8000.00

A.C. = ₹30,000.00

Invertor = ₹15000.00

Washing Machine = ₹10,000.00

Pumping set = ₹20,000.00

Flour Mill (domestic) = ₹15,000.00

Solar Gas = ₹30,000.00

Kolhu (electricity) = ₹40,000.00

Cultivator = ₹10,000.00

Harrow = ₹25,000.00

Licensed Arm = ₹1,00,000.00

Mobile Phone (ordinary) = ₹3,000.00

Mobile Phone (advanced) = ₹ 15,000.00

Kitchen Chimney = ₹12,000.00

Coffee maker = ₹2000.00

Electric kettle = ₹1500.00

Zym equipments = ₹ 30,000.00

Furniture = As applicable

Dish washer = ₹20,000.00

Water filter = ₹10,000.00

Disc Antenna = ₹ 4,000.00

L.P.G. = ₹3,000.00

Utencils etc. = As applicable

Jewelry = As applicable

Milking Animal = ₹15,000.00

D.V.D. Player = ₹ 5,000.00

Music system = ₹ 10,000.00

Jet pump = ₹30,000.00

Microwave oven = ₹ 10,000.00

Lap-top = ₹30,000.00

Generator = ₹40,000.00

Refrigerator = ₹ 15,000.00

Silai Machine = ₹5000.00

Tubewell = ₹40,000.00

Threshing equipment = ₹ 30,000.00

Solar Plant = ₹6000.00

Kolhu (ox) = ₹15000.00

Rice mill = ₹30,000.00

Labeller = ₹5000.00

Conveyance facilities (Average costs in Rs.) :

Rickshaw = ₹4000.00	Cycle = ₹ 2000.00	Scooter = ₹20,000.00
Motorcycle = ₹45000.00	Tractor = ₹ 4,00,000.00	Mini loader = ₹3,00,000.00
Auto-rickshaw = ₹1,50,000.00	Jeep = ₹6,00,000.00	Truck = ₹20,00,000.00
Economic Car = ₹ 3,00,000.00	Bus = ₹20,00,000.00	Medium value car= ₹4,00,000.00
Luxury car = ₹15,00,000.00	Mini Truck = ₹ 8,00,000.00	

**C- EDUCATIONAL PROFILE
FOR URBAN & RURAL BOTH-**

C.1 Educational qualification:

Family Members	0	2	4	6	8	10
1-						
2-						
3-						
4-						
5-						
6-						

- 0 = Illiterate/ just literate
- 2 = Up to primary education
- 4 = Up to secondary education
- 6 = Up to graduation/Diploma holders
- 8 = Up to post-graduation/ professional degree
- 10 = Higher studies (Ph.D., M.D., M.S., D.Litt, M.C.H., D.M., D.N.B. etc.)

Final score = total sum of scores obtained by indexed family members (the person aged 18 yrs or above) divided by number of indexed family members =

C.2 Computer proficiency:

Family Members	0	2	4	6	8	10
1-						
2-						
3-						
4-						
5-						
6-						

- 0 = Non-proficient
- 2 = Computer proficient but having no certificate/diploma or degree
- 4 = having certificate/O level course in computer application
- 6 = having diploma/A level course in computer application
- 8 = having bachelor's degree/B level course in computer application
- 10 = having master's degree/C level course in computer application

Final score=total sum of scores obtained by indexed family members (the persons aged 18 yrs or above) divided by number of indexed family members =

Final Score = $\frac{C.1+C.2}{2}$ =

D- OCCUPATIONAL PROFILE (FOR URBAN AND RURAL BOTH):

Family members	0	2	4	6	8	10
1-						
2-						
3-						
4-						
5-						
6-						

- 0 = No gainful employment.
- 2 = Unskilled Labour (labour, agricultural labour, rickshaw puller), street vendor (goods up to ₹ 5000.00)
- 4 = Class IV employee, skilled worker (tailor, black smith, carpenter, washer-man, potter, barber, driver etc.), hawker, small shopkeeper (goods up to ₹ 50,000.00) petty farmer (cultivated land < 1 acre), caste occupation.
- 6 = Class-III employee, primary school teacher, high school teacher, small businessman (having his/her own or rented shop and goods up to ₹ 1, 00,000.00), farmer (cultivated land 1-10 acres) & private contractor, insurance agents etc, local public leader like corporator etc.
- 8 = Class-II employee/junior professionals (experience up-to 5 years), intermediate teacher, principals upto intermediate colleges, farmer (cultivated land up to 10-20 acres), business man (goods up to ₹ 1, 00,000.00 - 10, 00,000.00), Public leader like M.L.A. etc, Govt. contractor etc.
- 10 = Class-I employee/executives/senior professionals (experience more than 5 years), university/degree colleges teachers, principals of degree colleges, professors, farmers (land more than 20 acre), businessman (goods > ₹ 10,00,000.00), leaders like MP's etc.

Final score: Total sum of scores divided by the number of family members who are engaged in monetarily gainful activity. =

E- ECONOMIC PROFILE:

URBAN:

Average per capita income (In Rs.) per month: (From all sources)

None	Up to ₹ 1000.00	₹ 1001.00 – 6000.00	₹ 6001.00 – 16,000.00	₹ 16001.00 – 30,000.00	>₹ 30000.00
0	2	4	6	8	10

Final score =

RURAL:

Average per capita income per month: (From all sources)

None	Up to ₹ 1000.00	₹ 1001.00 – 4000.00	₹ 4001.00 – 10,000.00	₹ 10001.00 – 20,000.00	>₹ 20000.00
0	2	4	6	8	10

Final score =

F- POSSESSED LAND/HOUSE COST PROFILE :

FOR URBAN & RURAL BOTH:

None	Up to ₹ 1,25,000.00	₹ 1,25,001.00- 12,50,000.00	₹ 12,50,001.00- 50,00,000.00	₹ 50,00,001.00- 1,25,00,000.00	>₹ 1,25,00,000.00
0	2	4	6	8	10

Final score =

G- SOCIAL PROFILE : - (URBAN & RURAL BOTH)

G. 1- Understanding of social issues:

None	Religious-Cultural	Developmental	Educational	Health promotional	Political
0	2	2	2	2	2

G.1 Score: Sum of scores obtained =

G.2- Participation in social activities:

None	Religious-Cultural	Developmental	Educational	Health promotional	Political
0	2	2	2	2	2

G.2 Score: Sum of scores obtained =

Final score: $\frac{\text{G.1 Score} + \text{G.2 Score}}{2}$ =

Understanding & participation of activities in social profile:

- Religious-cultural :** Understanding & participation in religious activities as head, priest, worships, rituals, religious preaching, satsang/ participation in marriages, folk meetings, folk activities, parties etc.
- Educational :** Understanding & participation in illiteracy removal activities like old age education, orphan education, women education etc.
- Developmental :** Understanding & participation in developmental activities i.e.- improving hygiene, Sanitation, drinking water, road , school development etc.
- Health Promotional :** Understanding & participation in health education programs, immunizations, nutritional, mother – child care and other governmental & non- governmental health programs.
- Political:** Understanding & participation in political activities at village level, block level, istrict level, state level, national level etc..

INFORMATION AND CONSENT FORMS

INFORMATION FORM
PREVALENCE AND CORRELATES OF ALCOHOL CONSUMPTION
RUHSA, COMMUNITY MEDICINE DEPARTMENT
CHRISTIAN MEDICAL COLLEGE, VELLORE

NAME:

AGE:

SERIAL NO.:

The “Prevalence and Correlates of Alcohol Consumption” study aims to obtain information on consumption of alcohol amongst men aged between 20-35yrs, from rural India. We shall be asking you questions related to the type of alcohol you consume, the amount of alcohol you consume and if there is any specific pattern of your drinking. Certain factors which we presume to be related to consumption of alcohol, leading to problem drinking will be assessed and compared amongst different groups of alcohol consumers. For this purpose we will be asking questions related to demographic profile, socio-economic status and social relationships.

There is no expenditure incurred by you towards participation in this study and participation is completely voluntary.

There will be no monetary benefit or compensation, if you decide to participate in this study.

If you are undergoing treatment from RUHSA or Christian Medical College Vellore, and decide against participating in the study, there will be no compromise in the treatment rendered to you.

If you decide to withdraw from the study, the information provided thus far, will not be used and will be destroyed. If you are undergoing treatment from RUHSA or Christian Medical College Vellore, there will be no compromise in the treatment rendered to you.

Your identity will be disclosed to no one other than the investigators and will be used for the sole purpose of data analysis of this study. The study may be printed in a medical journal, but your particulars will not be revealed.

If you have any doubt or query, you can contact Dr. Soumyajit Bose at 04162284305 / 9488554783 or can directly approach RUHSA Hospital in K.V. Kuppam Block

CONSENT FORM

**Study Title: Prevalence and Correlates of Alcohol Consumption among men from
rural Tamil Nadu**

Subject's Name: _____

Age : Serial No. :

- (i) I confirm that I have read and understood the information sheet dated _____ for the above study and have had the opportunity to ask questions.
- (ii) I understand that my participation in the study is voluntary and that I am free to withdraw at any time, without giving any reason, without my medical care or legal rights being affected.
- (iii) I understand that the Ethics Committee and the regulatory authorities will not need my permission to look at my health records both in respect of the current study and any further research that may be conducted in relation to it, even if I withdraw from the study. I agree to this access. However, I understand that my identity will not be revealed in any information released to third parties or published.
- (iv) I agree not to restrict the use of any data or results that arise from this study provided such a use is only for scientific purpose(s).
- (v) I agree to take part in the above study.

Signature (or Thumb impression) of the Subject/Legally Acceptable

Date: ____/____/____

Signatory's Name: _____

Signature:

Or



Representative: _____

Date: ____/____/____

Signatory's Name: _____

Signature of the Investigator: _____

Date: ____/____/____

Study Investigator's Name: _____

Signature of the Witness: _____

Date: ____/____/____

Name & Address of the Witness: _____

மதுபானம் அருந்துபவர்களின் நிலை தொடர்பான ஆராய்ச்சி

ரூலா, சமூக நலத்துறை, கிருஸ்துவ மருத்துவக்கல்லூரி, வேலூர்

பெயர் :

வயது :

வரிசை எண் :

மதுபானம் அருந்துபவர்களின் நிலை தொடர்பான ஆராய்ச்சியில் தகவல்கள் மதுபானம் அருந்தும் ஆண்களின் வயது 20 – 35 வரை பெறப்படுகிறது. நாங்கள் மதுபான வகை, அளவு அருந்தும் முறை தொடர்பாக சில கேள்விகளை கேட்போம், நாங்கள் கருதும் மதுபானம் அருந்துவதற்கான காரணங்களை வைத்து மேல் குறிப்பிட்ட வயதினரிடையே ஆய்வு செய்கின்றோம். அதற்காக நாங்கள் தங்கள் விபரங்கள், சமூக பொருளாதார மற்றும் சமூக தொடர்புடையோர் அடிப்படையில் சில கேள்விகளை கேட்கின்றோம்.

ஆய்விற்காக பங்கெடுப்போர் ஒன்றும் செலவிட தேவையில்லை. இது முழுவதும் தங்களின் கையாள்வத்தின் அடிப்படையானது.

இந்த ஆய்வில் பங்கெடுப்பவர்களுக்கு எந்த சிறப்பான சலுகைகளும் தரப்படமாட்டாது.

ரூலா, சமூக நலத்துறையிலிருந்து சிகிச்சை எடுக்கும் தனிநபர் இந்த ஆய்வில் பங்கு பெற எதிர்த்தால் சிகிச்சை வழங்குவதில் எந்த மாற்றம் / சலுகைகள் தரப்படமாட்டாது.

தனிநபர் ஆய்விலிருந்து விலக விரும்பினால் அவர் கொடுத்த தகவல்கள் ஒன்றும் பயன்படுத்தப்படமாட்டாது. ரூலா சமூக நலத்துறை பிரிவிலிருந்து பெறும் சிகிச்சையில் எந்த சலுகைகளும் தரப்படமாட்டாது.

தனிநபர் பற்றிய விவரங்கள் ஆய்வாளரை தவிர வேறொருவருக்கும் தெரிவிக்கப்பட மாட்டாது. விவரங்கள் அனைத்தும் ஆய்விற்காக மட்டுமே பயன்படுத்தப்படும். இந்த ஆய்வு மருத்துவ ரீதியான பத்திரிக்கையில் மட்டுமே அச்சிடப்படும். ஆனால் தனிநபரின் விபரங்கள் அனைத்தும் மறைமுகமானது.

தகவல் ஒப்புதல் படிவம்

தனிநபர் ஆய்விற்கான தகவல் ஒப்புதல் படிவம்

ஆய்விற்கான தலைப்பு : மதுபானம் அருந்துபவர்களின் நிலை தொடர்பான ஆய்வு.

உறுப்பினரின் பெயர் :

வயது :

வரிசை எண் :

- 1) நான் இந்த படிவதிலுள்ள அனைத்து தகவல்களையும் மேல் குறிப்பிட்ட ஆய்வின் படி நான் புரிந்து கொண்டேன் மற்றும் கேள்விகள் கேட்ட உரிமை பெற்றேன்.
- 2) நான் இந்த ஆய்வானது முழுவதும் எனது தள்ளார்வத்தின் அடிப்படையானது என்றும் நான் எந்த நோத்திலும் இந்த ஆய்விலிருந்து விலகிக் கொள்ளலாம். அதற்கான எந்த காரணம், சட்ட ரீதியான உரிமையும் தாத் தேவையில்லை என்பதை நன்கு அறிந்துள்ளேன்.
- 3) இந்த ஆய்வை செய்பவர், அதில் பணி செய்யும் மற்றவர், உயர் பொறுப்பிலுள்ள ஆய்வு ரீதியாக தொடர்புடையோர் என்னுடைய விபரங்கள் தொடர்பான பதிலினை பார்ப்பதற்கும், மேலும் எதிர் காலத்தில் இது தொடர்பான ஆய்வை மேற்கொள்ளவும் உரிமை உண்டு என்பதை நன்கு அறிந்துள்ளேன். மேலும் என்னுடைய விபரங்கள் அனைத்தும் முற்றிலும் மறைமுகமானது என்பதை நன்கு அறிவேன்.
- 4) இந்த ஆய்வின் அடிப்படையில் வெளிவரும் அனைத்து முடிவுகளும் முழுவதும் அறிவியல் ரீதிக்காக மட்டுமே பயன்படுத்தப்படும் என்பதை நம்புகிறேன்.
- 5) நான் இந்த ஆய்வில் பங்குபெற முழு ஒப்புதல் அளிக்கிறேன்.

உறுப்பினரின் கையெழுத்து

தேதி

உறுப்பினரின் பெயர் :

கையெழுத்து :

(அல்லது)

உறுப்பினர் :

தேதி :

பெயர் :

ஆய்வாளரின் கையெழுத்து :

தேதி :

ஆராய்ச்சி ஆய்வாளரின் பெயர் :

சாட்சியாளரின் கையெழுத்து :

இந்த ஆய்வைப்பற்றிய ஏதேனும் சந்தேகங்கள் அல்லது கேள்விகள் இருந்தால் டாக்டர். செளந்திரபிரசாத் அவர்களை 04152284305 என்ற எண்ணில் தொடர்பு கொள்ளவும் அல்லது நேரடியாக ரூசா மருத்துவமனை (RUHSA), கீ.வ.குப்பம் (K.V. Kuppam)-த்தில் சென்று சந்திக்கவும்.

INSTITUTIONAL REVIEW BOARD CLEARANCE LETTER



OFFICE OF RESEARCH INSTITUTIONAL REVIEW BOARD (IRB) CHRISTIAN MEDICAL COLLEGE, VELLORE, INDIA.

Dr. B.J. Prashantham, M.A., M.A., Dr. Min (Clinical)
Director, Christian Counseling Center,
Chairperson, Ethics Committee.

Dr. Alfred Job Daniel, D Ortho, MS Ortho, DNB Ortho
Chairperson, Research Committee & Principal

Dr. Nihal Thomas,
MD., MNAMS., DNB (Endo), FRACP (Endo), FRCP (Glas) (EDIN)
Deputy Chairperson
Secretary, Ethics Committee, IRB
Additional Vice Principal (Research)

June 20, 2014

Dr. Soumyajit Bose
PG Trainee in MD Community Health
Department of Community Medicine
Christian Medical College
Vellore 632 004

Sub: **Fluid Research grant project:**
Prevalence and correlates of alcohol use among men in rural Tamil Nadu.
Dr. Soumyajit Bose, Post-Graduate Trainee in MD Community Medicine,
Dr. Rita Isaac, RUHSA, Dr. Anju Kuruvilla, Psychiatry, CMC, Vellore.

Ref: IRB Min No: 8609 [OBSERVE] dated 07.01.2014

Dear Dr. Soumyajit Bose,

The Institutional Review Board (Blue, Research and Ethics Committee) of the Christian Medical College, Vellore, reviewed and discussed your project entitled "Prevalence and correlates of alcohol use among men in rural Tamil Nadu." on January 7th 2014.

The Committees reviewed the following documents:

1. IRB Application format
2. Curriculum Vitae' of Drs. Soumyajit Bose, Rita Isaac, Anju Kuruvilla.
3. Prevalence and Correlates of Alcohol Questionnaire (English & Tamil)
4. Information sheet (English & Tamil)
5. Consent form (English & Tamil)
6. Socio - Economic Status Scale
7. No of documents 1-6

The following Institutional Review Board (Blue, Research & Ethics Committee) members were present at the meeting held on January 7th 2014 in the CREST/SACN Conference Room, Christian Medical College, Bagayam, Vellore 632002.

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INSTITUTIONAL REVIEW BOARD (IRB)
CHRISTIAN MEDICAL COLLEGE, VELLORE, INDIA.**

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Deputy Chairperson
Secretary, Ethics Committee, IRB
Additional Vice Principal (Research)

Name	Qualification	Designation	Other Affiliations
Dr. T. Balamugesh	MBBS, MD(Int Med), DM, FCCP (USA)	Professor, Pulmonary Medicine, CMC, Vellore	Internal, Clinician
Dr. Mathew Joseph	MBBS, MCH	Professor, Neurosurgery, CMC, Vellore	Internal, Clinician
Dr. J. Visalakshi	MPH, PhD	Lecturer, Dept. of Biostatistics, CMC, Vellore	Internal, Statistician
Dr. Susanne Abraham	MBBS, MD	Professor, Dermatology, Venerology & Leprosy, CMC, Vellore	Internal, Clinician
Dr. Ranjith K Moorthy	MBBS M Ch	Professor, Neurological Sciences, CMC, Vellore	Internal, Clinician
Dr. Vivek Mathew	MD (Gen. Med.) D.M (Neuro) Dip. NB (Neuro)	Professor, Neurology, CMC, Vellore	Internal, Clinician
Mrs. Shirley David	M.Sc, PhD	Professor, Head of Fundamentals Nursing Department, CMC.	Internal, Nurse
Mrs. Pattabiraman	B. Sc, DSSA	Social Worker, Vellore	External, Lay person
Mr. C. Sampath	B. Sc, BL	Legal Expert, Vellore	External, Legal Expert
Dr. Ebenezer Ellen Benjamin	M.Sc, PhD	Professor, Maternity Nursing, CMC, Vellore	Internal, Nurse
Dr. B. J. Prashantham	MA(Counseling Psychology), MA(Theology), Dr. Min(Clinical Counselling)	Chairperson, Ethics Committee, IRB. Director, Christian Counseling Centre, Vellore	External, Social Scientist

IRB Min No: 8609 [OBSERVE] dated 07.01.2014

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Deputy Chairperson
Secretary, Ethics Committee, IRB
Additional Vice Principal (Research)

Dr. Jayaprakash Muliylil	B. Sc, MBBS, MD, MPH, Dr PH (Epid), DMHC	Retired Professor, Vellore	External, Scientist & Epidemiologist
Dr. Denise H. Fleming	B. Sc (Hons), PhD	Honorary Professor, Clinical Pharmacology, CMC, Vellore	Internal, Scientist & Pharmacologist
Rev. Joseph Devaraj	B. Sc, BD	Chaplaincy Department, CMC, Vellore	Internal, Social Scientist
Dr. Nihal Thomas,	MD, MNAMS, DNB(Endo), FRACP(Endo) FRCP(Edin) FRCP (Glasg)	Professor & Head, Endocrinology. Additional Vice Principal (Research), Deputy Chairperson, IRB, Member Secretary (Ethics Committee), IRB, CMC, Vellore	Internal, Clinician

We approve the project to be conducted as presented.

The Institutional Ethics Committee expects to be informed about the progress of the project, any **adverse events** occurring in the course of the project, any **amendments in the protocol and the patient information / informed consent**. On completion of the study you are expected to submit a copy of the **final report**. Respective forms can be downloaded from the following link: <http://172.16.11.136/Research/IRB Polices.html> in the CMC Intranet and in the CMC website link address: <http://www.cmch-vellore.edu/static/research/Index.html>.



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Deputy Chairperson
Secretary, Ethics Committee, IRB
Additional Vice Principal (Research)

Fluid Grant Allocation:

A sum of Rs. 14,000/- INR (Rupees Fourteen Thousand only) will be granted for 2 years.

Yours sincerely

Dr. Nihal Thomas
Secretary (Ethics Committee)
Institutional Review Board

Dr. NIHAL THOMAS
MD., MNAMS., DNB (Endo), FRACP (Endo), FRCP (Edin), FRCP (Glasg)
SECRETARY - (ETHICS COMMITTEE)
Institutional Review Board,
Christian Medical College, Vellore - 632 002

Cc: Dr. Rita Isaac, RUHSA, CMC, Vellore

