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Alcohol and its induced aura that imposed adverse effects on socio-economic, neurobehavioural and biological health in Indians

[1] Rajesh Kumar Kori, [*2] Dr. Deepak Gupta

[1] Research Fellow, M.Sc. (Forensic Science), Department of Criminology & Forensic Science, School of Applied Sciences, Dr. Harisingh Gour Central University, Madhya Pradesh, India

[2] Assistant Professor, Ph.D. (Criminology), Department of Criminology & Forensic Science, School of Applied Sciences, Dr. Harisingh Gour Central University, Madhya Pradesh, India

Abstract
A chronic alcohol consumption (CAA) is a global problem for economic and health of an addicted person. The adverse effects of chronic and acute alcoholism have been started with short-term pleasant experience like a hangover, insanities extend with long-term addiction habits that lead to critical adverse health outcomes like cancer, a developmental disorder, neurobehavioural disorder (Depression, Anxiety, Impulsiveness, Aggression). Consequently, person entrapped with disorder riddle with imprudence, depressed, anxious, impaired decision slipped into the valley of detainment, loneliness state that trigger to think the permanent solution to pain or problem mostly that ends in different ways one might be initiated with suicidal ideation, suicidal attempts or suicide (inward aggression), another could be reclaimed criminal instincts or another criminal activity. Patterns of alcohol consumption also increase the risk of violence and the likelihood that aggressive behaviour will escalate. Beside the self-possessed adverse effects of alcoholism and its induce aura extends its boundaries to reflect more problems include economic losses, alcohol-related illness and injury, disruption of family and social relationships, emotional problems, impact on perceived health, violence and aggression, and legal problems. The purpose of the study was to accomplish most up-to-date, robust and reliable a wide range of systematic review that integrated alcoholism induces aura and its effects on intrinsic (health, genetic, psychological makeup) as well as extrinsic factors (family members, friends, social interaction) of alcohol intoxication. The limited studies carried out regarding alcoholic addict person correlated with lives of those around them and effects of alcoholism on the economic as well social vicinity. Therefore, this review provides unique literature, widest correlated factors regarding the alcoholism effects.

Keywords: hangover; neurobehavioural disorder; suicide; criminal intents; social interaction; intrinsic factors; extrinsic factors

1. Introduction
In the quest of human desires could be one of the reasons which leaded foundation to discover alcohol as the desire of pleasure, sorrow releaser, excitement, and talkativeness induce substance [1, 2]. An anxious nature and curiosity could be the natural instinct or behaviour of humans, past pleasant experiences some reasons leads to drift person into alcohol intoxication. Alcohol has been one of the most commonly used chemical substances for intoxication by man since time immemorial [3]. The word 'alcohol' probably originated from the Arabic term 'al-kuhul', meaning 'the kohl' (powder for the eyes), which later came to mean 'finely divided spirit' and then scientifically known as ethyl alcohol that is a low molecular weight hydrocarbon derived from the fermentation of sugars and cereals [4, 5]. Alcoholic beverages were often an important part of social events in for the purpose of recreational, medicinal and ceremonial purposes documented in religious, mythological and medical texts [3, 6, 7]. In many cultures, drinking habits play a significant role in social interaction — mainly because of alcohol's neurological, psychological effects [8]. Now, it has been a matter of time that excess alcohol intoxication habits tend to lead alteration in human behaviours although this temperament of human behaviour initiated alcohol discovery. Alcohol has been psychoactive as well as a sedative-hypnotic drug that could act as a depressant, metabolic disruptors as well as detrimental effects on Central Nervous System (CNS) to cause depression, anxiety, impulsiveness, numbness and slow down brain reflexes [5, 9, 10] and then leads mood disorders. A euphoric state and brain numbness provide instant pleasure, well being for drinkers. In order to achieve a feeling of well being, pseudo self-confidence and excitement alcohol drinkers take more amount of alcohol which tends to trigger over excitement and that ensure higher agitation or impulsive behaviour [5, 11, 12, 13]. Ultimately over alcohol intake provoke mechanism to lower down conditional thinking process, reduces attention and slows reaction speed results in a hangover [5, 14, 15, 16]. Long-term repeatability of several hangover modes reduces mental capacity towards conditional and realistic thinking. This would be further diminished futuristic approaches to govern control over own intoxication that leads a person towards irresistible convergent alcoholic addiction. An addiction is a progressive and incurable disease, which affects physical, mental and wide spheres of human beings, characterized by an inability to control their actions over the use of alcohol and other sedatives [5]. However, the factors including

psychological, genetic, environmental and behaviour can all contribute to having this disease [17, 18, 19]. The chronic alcohol addiction (CAA), habits induce several immediate as well as delayed adverse health abnormalities as shown in figure 1.

Fig 1: Represents symmetric adverse effect of chronic alcohol consumption that might lead to neurological, endocrinal impairment, developmental, genetoxicological as well as systemic health effects on human body

There were no such effective remedy for CAA that could be growing and frightening disease [20, 21] because of inability to abstain from drinking or might be due to withdrawal symptoms. [22] The CAA effects vulnerable brain physiology and functionality that control behaviour [23, 24, 25]. This incompetence thinking manner induces by addiction difficult to solve conditional problems results into regular failures which further lead to abnormal reaction to unexpected circumstances. Consequently leads to cognitive or behavioural changes like depression, anxiety, impulsiveness, aggression, agitation [5, 9, 10, 26, 27] although it was not possible to determine if adolescents drink due to depression or if depression occurs as a toxic effect of alcohol consumption [28, 29, 30]. Due to conditional reactive outcomes, variant failures and hatred all together could impose impaired decision making. Consequently, alcohol drinkers further start thinking for permanent solution to miseries, hurdles and then mostly drinkers start to think about suicidal ideation, suicidal ideation into action and also provide motivation (stimulus) to carry out a suicidal attempt, suicide (inward aggression) and criminal intends. [31, 32, 33, 34, 35, 36] However, with these alarming adverse health effects WHO (2014) [37] reported, about 38.3% or more than 2 billion alcoholics reported to consume alcohol regularly worldwide and these figures have been increasing with year due to inclusive habits of newcomers or teenagers. The Indian population contributes 30% alcoholics to total global figures, out of that 11 % are moderate to heavy drinkers. On an average an individual (+15 age) consumption amounts to 6.2 litres of alcohol per annum. The average Indian consumes about 4.3 litres of alcohol per annum and rural average was much higher at about 11.4 litres a year due to various reasons but some of reasons were less awareness and cost-effective liquors with ease of availability. It was, therefore higher alcohol addiction habits (4.1% of total problems) prominent causes of suicides among agricultural labourers. [38] So, it could be speculated that CAA engulfed lifespan of farmer's i.e. one hands of manufactures tires. Alcohol abuse leads to the death of 3.3 million people annually and the death of 4.9

million people were reported in 2010 [37]. Nearly one in 20 Indian men has an addiction or alcohol-related disorder with variant drinking habits.(37) According to NCRB (2013) [39] data it was to be estimated that everyday 15 people dies and approximately one person in 95 minutes due to severe intoxication. Due to the consumption of alcohol and associated adverse health effects, this problem ranks among the world's major threats to human health and safety. The harmful consequences of over alcohol intoxication would be to adverse physical health, psychological well-being and marginal relationship cause an impact on all facets of society. Simultaneously, moderate and low alcohol consumption has certain health benefits like over coronary heart disease, stroke and diabetes mellitus while excessive chronic drinking resulting in alcohol toxicity including mild to moderate tremors, irritability, anxiety and agitation [5, 9, 10]. In recent years, remarkable increase in number of female alcoholics in cultural inherited Indian continents as well as across worldwide. It induces teratogenic effects and prolong over alcohol consumption during pregnancy may lead to fetal alcoholic syndrome [10]. Behavioral and cognitive deficits have also been reported even at low levels of prenatal alcohol exposure which further suggested that consumption of excess alcohol couldn't be safe in pregnancy [40]. A supra-multiplicative synergistic effect of alcohol consumption and tobacco smoking habits has a increased combined effect over stroke mortality**,** compatible with a greater than multiplicative increase in oral and pharyngeal cancer risk [41, 42, 4.3]. However, alcohol consumption increases the risk of head and neck cancers also in absence of tobacco**.** Nicotine enhances ethanol (EtOH)'s hypnotic effects in a synergistic manner [44]. However, smoking affected respiratory mortality with little effect of alcohol [45]. The intoxication of both consumption habits was found to be most common during road accidents. During consumption of alcohol and tobacco person need solicited compartment or place vehicle provide appropriate place or environments to execute this act. The long-term drinking and driving issue have dominated public discourse on alcohol-related problems. More than 25 % of traffic accident or road accidents conquered due consequences of alcohol-related intoxication [5]. Driving under influence of drug/alcohol had caused 2.0% of fatalities in road accidents. Majority of accidents (78.4%) were caused due to driver's faults like over speeding, driving under the influence of alcohol or drugs, and hit and run cases [46]. Beside that industry association sources estimate that 15% to 20% of absenteeism and 40% of accidents at work are due to alcohol [47]. In order to control road accidents government of India had took various preventive measures. They set threshold legal limit of blood alcohol content (BAC) is 0.03% or 30mg per 100ml of blood under Sec 185 of the Motor Vehicles Act 1988, India during drunk and drive. Beside, these measures many variants factors are directly responsible for person to be alcoholic including family problems, social consequences stranger violence, non-traffic injuries, social interaction, loneliness and attempted suicide. Alcohol intoxication or CAA is a major contributor in domestic violence and family [38, 47]. It was reported that third of violent husbands drink, and most of the violence takes place during intoxication [48]. Studies of partner violence episodes also indicate that episodes were more severe when the man has been drinking [50, 51, 52]. Due to increasing incidences of alcohol addiction and adverse health effects associated with it, the present study is carried out to assess divergent aura of alcohol severity in context to biological, genetic, social, economic and psychological aspects.

2. History of alcohol in India

The alcohol existence and uses in ancient India had been documented in religious, mythological and medical references [6, 7]. Alcoholic beverages in the Indus valley civilization (2000 B.C.) appeared in Chalcolithic Era (copper Age) further evidentially justified by means of various practices like fermentation and distillation for alcohol use. Many archaeological and monumental evidence like distillation outfit made of clay items recovered from Taxila, and numerous remains of still from the Shaikhan Dheri (Charsadda, NWFP, Pakistan) was excavations these shows evidential proof of this era for use of alcohol in India. (54) These 'Gandhara stills', were used to distil an alcoholic beverage which may well have been the intoxicating liquid called sura, derived from fermented rice & barley and condemned in the Rig Veda. Some studies demonstrated inebriating effects of Soma and Sura that were found in the Vedic texts dated back to 2000 B.C [7, 522]. So, it could be inferred that ritualistic and household uses of these concoctions were prevalent in the Pre Vedic and Early Vedic period- 2000 BC- 800 BC approximately. (51, 53) The first instance of the prohibition on the use of alcohol appeared only in 200 BC was restricted to the priestly class i.e. the elite Brahmins, with the introduction of the Laws of Manu.(7) However, no further restrictions were set on drinking by other strata of society results into colonies, religiously, castewise compartmentalized in India. (7) In, the 3rd century BC spread of Buddhism and Jainism practices paved the attribution of religious and moral legitimacy to abstinence.(7) During the Mughal era (1200-1700 AD), despite the stronger emphasis on the prohibition of alcohol use in Islam, drinking was common and alcohol use was not prohibited by the state. In fact, some Mughal emperors themselves consumed alcohol and opium. (55) The wine was also a prominently used by courtiers, nobles and poets to accomplished professional practices. (54) During the British rule (1858 -1947 A.D) predetermined social stratification on alcohol prohibition, underway to changes due to rapid industrialization and urbanization. These uprooted changes stretch boundaries for upward class and caste mobility to use alcohol. Thus a growing middle class embraced the upper-caste norms of vegetarianism and abstinence from alcoho [6]. Meanwhile, manufacturing of alcohol became restricted to licensed government distilleries to beneficiated British Empire or British companies. Ultimately leads to the replacement of traditional alcoholic beverages to mass-produced factory made products with greater alcohol content [6]. Substantially, we stated that use of illicit liquor under the British period was in benign mode i.e. slow and steady [54]. During Freedom strugglance (1857-1947) Mahatma Gandhi and other prominent leaders influence follower to restraint and abstinence to accomplish independence destination. Beside that foreign liquor competency in the market was diminished as a result of non-cooperation movement and civil disobedience movement in

the 1920'saginst British Government. In post-independence period India Prohibition thus eventually made its way into the Constitution as a Directive Principles of State Policy of Independent India. States have full control of alcohol legislation, state excise rates and the production and sale of alcohol [55]. The initial emphasis of the newly independent India on the prohibition of alcohol consumption and sale started with Manipur, Gujarat and then opted by many states. Unfortunately lasted in most states until the mid- 1960's, by 1970 only the state of Gujarat retained a complete prohibition policy. Currently, at the state level three main types of prohibition policy have been implemented: one of complete prohibition of production and consumption; the second was partial prohibition - of liquor (usual arrack) is prohibited; and third dry days where consumption is prohibited on certain days of the week or month [55, 56].

3. Types of Alcohol consumption in Indian continents

Alcoholic beverages that have lower alcohol composition like beer and wine were produced by fermentation of sugars or starch containing plant materials. Beverages of higher alcoholic composition like spirits were produced by fermentation followed by distillation for purification.

In India, consumption and sale of branded alcohol (showed as in Table -1) much lesser than non-branded. The illicit liquor targeting higher percentage lower-middle-class consumers due to availability in low price. The illicit liquor is mostly produced in small production units known to be as clandestine labs due to easy availability of raw materials according to localities that contain a different percentage of alcohol. (Table-2).

Table 1: Types of most surplus branded alcohol beverages consume in Indian Markets

S. NO	Type of alcohol	Percentage of ethanol	Crude material	Impurities or by-products
1.	Beer	4 to 8%	Cereal grains (wheat, maize rice)	Sugars. Methanol, Starch and Lignin and metallic residue
2.	Wine	10 to 22%	Grapes (also other fruits)	Propanol, isobutanol, n-butanol, isopropanol, metallic contaminants
	Port wine	19 to 20%	Grapes	Methanol or higher alcohol impurities, metallic contaminants
	Sherry wine	16 to 18%	Grapes	Propanol, isobutanol, n-butanol, isopropanon, metallic contaminants
	Champagne	11.5% to 12.5%	Grapes grown	Propanol, isobutanol, n-butanol, isopropano, metallic contiminants
3.	Spirits	20 to 25 %	Molasses	Starch and Lignin, Metallic contaminants
4.	Brandy	40 to 50%	Fruit juices	Higher alcohol and heterocyclic compound, metallic contaminants
5.	Whisky	40 to 55%	Cereal grains	Esters, organic acids, and higher alcohols, cyclic and heterocyclic compounds, metallic contaminants
6.	RUM	40 to 55%	Molasses/sugarcane	Starch and Lignin, metallic contaminants

With no legal quality control checks on them, an alcohol concentration of illicit liquor varies up to 55%. Most contaminants could be as residue in illicit liquor as a methylated spirit being a common adulterant, which occasionally causes incidents like mass poisoning with consumers losing their lives or suffering irreversible damage to the eyes or sometimes leads to blindness. (as shown in Table 3).

Alcohol consumption associated with widest ranges of social and physical characteristics among neighbourhoods. The illicit liquor manufactured in clandestine labs surplus benefits over branded alcohol beverages in the context of an intense hangover, availability, cost-effectiveness, popularity and marketing amongst the local users. The effects were examined at different scales ranging from regional (e.g. state level) to census tracts or mesh blocks [57]. India has been a very diverse country with considerable variation in climate, vegetation, natural resources, cultures and traditions. This diversity has been also reflected in the types of alcoholic beverages consumed and the cultural meaning associated with alcohol use.

Table 2: Represents different origin of illicit liquors their manufacture features and consumption over different locality of India continents

S. No	Type of alcohol drink	Crude material	Alcohol percentage	Country
1	Arrack	Paddy or wheat, fermented molasses, raw brown sugar, palm wine, rice, or palm sugar	20-40%	Bangalore, India, Srilanka
2	Desi Sharab	Rice, wheat, mahua fruit	40-45%	India
3	Daru	Flowers of the mahuwa tree	20%-40%	Rajputs of north-western India
4	Tari			India
5	Jack-fruit wine	Pulp of jack-fruit (Artocarpus heterophyllus)	7%-8%	eastern hilly areas of India
6	Zu and Rohi	----	10 -20%	Nagaland
7	Tharra	----		India
8	Toddy	Sap of a Coconut palm	4%-6%	South India, Srilanka
9	Fenny, Feni, Fenim	Cashew feni and toddy palm feni	41-45%	Goa, India
10	Bangla Mad	Rice, sugar-cane, juice of date tree, molasses, and fruit juice	--------	Bangladesh
11	Cholai	Rice and mahua fruit	---------	West Bengal, Bangladesh
12	Raski	Millet (Kodo) or rice		Nepal

13	Tadi or Kallu, Kullu	Palm Wine	5%-6%	Maharashtra, Kerala, Tamil Nadu, Karnataka and Andhra Pradesh, Nepal,
14	Chayang or Chhaang	Barley, millet (finger-millet) or rice grains	4 to 10%	Nepalese and Tibetan region
15	Zawlaidi	Mizoram Grape Delight	11%- 14 %	Mizoram
16	Tongba	Millet	-------	Darjeeling, Sikkim and Nepal
17	Lugdi	Rice or barley	--------	Himalayan parts of Manali
18	Ara or Arag,	Rice, maize, millet, or wheat	-------	Bhutan
19	Plam wine	The sap of various palm trees	---------	Indonesia

Table 3: Media reported mass poisoning tragedies due to illicit alcohol consumption in India during the year 2003-16

S. No	Place, Year	Deaths or cases	Remarks
1	Bihar's Gopalganj town 2016	13 people	Illicit poisonous liquor
2	Mumbai, Maharashtra 2015	74 people	Extremely cheaply Bootleg liquor
3	Sangrampur, Magrahat, Usthi and Mandirbazar villages of south Parganas district (West Bengal) 2011	143 deaths, some suffer blindness	Illicit poisonous liquor
4	Tamil Nadu in February 2010	10 deaths	Illicit poisonous liquor
5	Lucknow and Unnao district, Uttar Pradesh in September 2009	30 deaths and 122 seriously harmed	Methyl alcohol enriched Illicit poisonous liquor
6	The Western state of Gujarat in July 2009	130 deaths	Illegally produced alcohol
7	Delhi, 2009	12 deaths	Illicit poisonous liquor
8	Odisha, 2006	22 deaths	Illicit poisonous liquor
9	Karnataka 2008	180 deaths	Illicit poisonous liquor
10	Rajasthan 2008	25 deaths	Country made illicit liquor
11	Bangalore 2008	180 deaths	Country made illicit liquor
12	Villupuram, Tamil Nadu, 2005	5 deaths	Alcoholic impurities
13	Nelamangala, Bangalore, 2005	21 deaths	Fake government emblems on the sachets
14	Hoskote, Bangalore, 2005	10 deaths	Alcoholic impurities
15	Rewari, Haryana, 2005	8 deaths	Alcoholic impurities
16	Bikaner, Rajasthan, 2005	5 deaths	Nearly 36 suspected to have died
17	Kolayat, Rajasthan 2005	21 deaths	----------
18	Menambedu, Tamil Nadu, 2005	13 deaths	Intoxicants worth Rs.170,000 and 15,175 litres illicit liquor seized
19	Lucknow, Uttar Pradesh, 2005	7 deaths,	----------
20	Cuddalore (near Chennai), Tamil Nadu 2004	46 deaths	120 treated, 29 lost their vision 33 deaths in the previous month
21	Diwosas, Bareilly, Uttar Pradesh, 2004	14 deaths	Illicit poisonous liquor
22	Thrissur, Kerala, 2004	3 deaths	Illicit poisonous liquor
23	Unnao, Uttar Pradesh, 2004	9 deaths	Illicit poisonous liquor
24	Mumbai, Maharashtra, 2004	99 deaths,100 hospitalized	1110 litres illicit liquor seized
25	Tangra, West Bengal, 2004	35 deaths	Illicit poisonous liquor
26	Koopana, Kerala, 2004	7 deaths, 30 ill	Illicit poisonous liquor
27	Hissar, Haryana, 2003	6 deaths, 12 ill	Illicit poisonous liquor
28	Dharwad, Karnataka, 2003	6 deaths	Illicit poisonous liquor
29	Tiruvallur, Tamil Nadu, 2003	13 deaths, 92 male ill	Illicit poisonous liquor

4. Effects of alcohol on consumer's health

The interaction and effect of alcohol through body depends on multiple factors age, dose, health condition, the physical state of body, hypersensitivity level, ADH level in liver, genetic factors [58, 59, 60, 61] and environmental conditions [62]. These all parameter cumulatively governs limit/potency of hangover during consumption of alcohol. Multiple factors such as on urine production, gastrointestinal, blood sugar concentration, sleep patterns, biological rhythms have been suggested for the onset of hangover [63]. Hangover generally reported by the drinkers, that could be characterized by the assemblage of unpleasant physical and mental symptoms, including a headache, fatigue, redness of the eyes, thirst, rapid heartbeat, tremor, sweating, dizziness, vertigo, depression, anxiety and irritability. The moderate alcohol consumption has certain health benefits like beneficial influence on coronary heart disease, stroke and diabetes mellitus [64] while excessive chronic drinking resulting in alcohol toxicity including mild to moderate tremors, irritability, anxiety and agitation [9, 10]. Beside the symptomatic adverse effects, excessive chronic drinking of alcohol tends person dependency on alcohol. Alcohol dependence (alcoholism or ADS) could be defined as "a cluster of behavioural, cognitive, and physiological phenomena that develop after repeated alcohol use and that typically include a strong desire to consume, difficulties in controlling its use, persisting in its use despite harmful consequences, a higher priority given to alcohol use than to other activities and obligations, increased tolerance, and sometimes a physical withdrawal state" (ICD-10). Alcohol dependency could be both physical and psychological level

both formats affects its environments and its loved ones. Alcohol psychosis has been defined as a cluster of psychotic phenomena that occur during or following alcohol use but that are not explained on the basis of acute intoxication alone and do not form part of a withdrawal state (ICD-10) [65].

4.1 Toxicokinetics of alcohol

The metabolism of alcohol accomplished in digestion, absorption and distribution [66]. Excretion can occur in several pathways, including oxidative metabolism, pulmonary, renal and dermal excretion.

4.1.1 Digestion and Metabolism

In the liver, more than 90 % of ingested alcohol goes series of enzymatic (ADH, cytochrome P4502E1 or CYP2E1 and Catalase) metabolic transformation i.e. oxidized to acetaldehyde by ADH and coenzyme nicotinamide adenine dinucleotide. This acetaldehyde converted into acetic acid, finally undergoes oxidation to carbon dioxide and water [67] as shown in figure 2. After metabolic transformation, it comes into bloodstream through selectively permeable cell membranes.

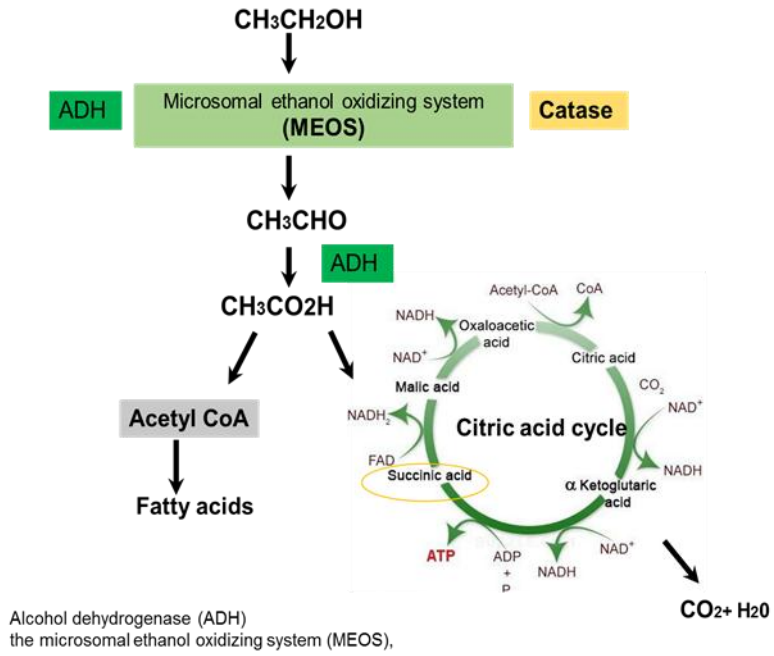

Fig 2: Represents sequential metabolism abducts of alcohol metab olism inside the liver

4.1.2 Absorption and Distribution

Alcohol has been rapidly absorbed from the gastric mucosa (20%) and small intestine (80%) and reached at a peak concentration 20-60 minutes after ingestion into the bloodstream due to high permeability of alcoholic abducts towards cell membrane [68, 69, 70]. So once alcohol in the bloodstream it could be diffuse into nearly every biological tissue of the body where it affects almost every organ in the body, but the brain is quite vulnerable in all respect of controlling physiology and behaviour [71].

4.1.3 Excretion

The alcohol could be absorbed from the ingestion (by stomach) or inhalation (by lungs) distributed by mean of blood to body fluids and tissues, ultimately eliminated slowly via the Pulmonary (lungs), renal (kidneys), and dermal (skin) outlets by slow metabolic oxidation [69, 70]. The alcohol excretion proportion varied according to abduct state present in the body. Helander and Beck (2005) [72] reported that about 95% elimination in the form of acetaldehyde, acetic acids later into carbon dioxide and water, about 0.01% in the form ethyl glucuronide and ethyl sulfate less than 5% remain unchanged further eliminated through lungs, sweat and urine.

4.2 Shorter-term effects or immediate effects

Alcohol stimulates the release of endorphins that giving the subject a sense of well-being Feelings of relaxation and cheerfulness which could encourage continued drinking. Increasing intoxication leads to euphoria, loss of inhibition, reduced coordination, garrulousness and belligerence [28, 73]. With increasing blood alcohol concentrations subjects experience lethargy, cardiorespiratory depression. With further intake, subjects develop stupor and coma that might end in death [74]. However, the intense short-term effect of alcohol intoxication was depending on variant factors like as health conditions, no. of drinks and its proportionate to blood alcohol concentration (BAC) for a hangover. (Figure-3)

4.3 Mid-term effects

Alcohol consumption disrupts the sleep-wake cycle, altering total sleep time [75]. Consolidation of learnt material takes place in sleep and so this could be adversely affected by persistent 21 drinking as shown in Figure 3.

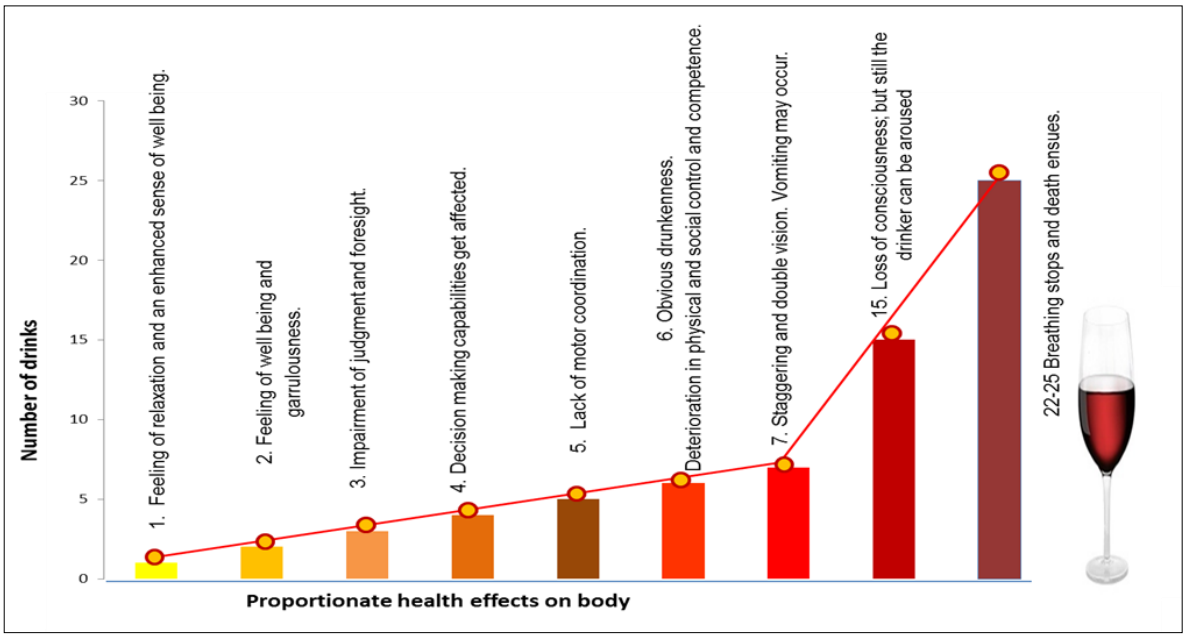

Fig 3: Represents proportionate relation between number of drinks and its reactive intense effect on human

Research suggested that alcohol has a more profound effect on memory and learning in adolescents than in people who start drinking in later life. It has been reported that the fatal dose of alcohol in childhood could be as lower (3 gms/kg) as compared to adult (5-8 gms/kg) [76]. In a ten year old child (wt 30 kg) equates to 1.5 bottles of wine and in an adult to 5 - 8 bottles with presumable adolescents in the middle, depending on weight. The elimination rate through metabolism of 0.1 g/l/hr or 0.08/kg/hr - in the blood means that if a 75 kg adolescent had a blood level of 1g/kg after a bottle of wine, it would take 10 hours for full elimination. So, this varied reducing proportion of alcohol in body temporary effect on memory, this young person could still have alcohol affecting their brain function in the school morning. So potentially there could be a problem with learning in school, or cope up with behavioural reflexes the morning after heavy drinking of night, in addition to the fatigue, lethargy or depressed mechanism associated with the alcohol-related sleep disruption.

4.4 Longer-term effects

Short-term tempting benefits of alcohol uses were like anxiety reduction and well-being state, in concert with longer-term anxiety induction from chronic drinking and withdrawal [77, 78].

Several regular episodes of short-term hangover tend to dependency over alcohol by altering physiology and metabolism of various organ systems. Their many studies suggested that chronic alcohol induce liver cirrhosis [19, 79]. that may further evolve into metabolic abnormalities like liver cancer [19]. Subsequently, use of alcohol leads to metabolic disturbance in the digestive tract or in the stomach by disturbing metabolism rate, the mechanism might cause oesophagitis, cancer [19] and gastritis and peptic ulcer in stomach respectively [81]. The persistence of metabolic disruption tends to chronic chest diseases, carcinoma, pneumonia, tuberculosis in lungs [83, 84]. and some deficits in pancreas [85], bladder [86] sex organs [87, 88]. However, moderate alcohol use has some beneficial outcome in coronary heart disease over adverse effect of heavy drinking like atrial fibrillation, hypertension, atherosclerosis, cardiomyopathy, myocardial infarction [89, 64]. Long-term alcohol consumption lead to alcoholic addiction triggers abstinence behaviour by altering HPA axis. Besides the metabolic disorder its induce structural as well as functional deviant marks on brain functionality like poor concentration, defective memory, blackouts, brain damage, cerebellar degeneration, injury to peripheral nerves [90, 91, 92].

Table 4: Represents short term and long term effects of alcohol consumption on various organ system

S. No	Systemic effects	Short term effects / Immediate effects	Long Term effects	References
1	Brain	Increase feeling of relaxation, well being Impairment of Judgment, Decision-making capacities and foresight, increase in intrepid temperament and aggression Lack of motor Coordination, irritability Vomiting in over drinking	Poor concentration, defective memory, blackouts, brain damage, cerebellar degeneration, injury to peripheral nerves	90, 91,92
2	Oesophagus	Irritation in vowel	Oesophagitis, cancer	80
3	Heart	Increase in heartbeat in moderate level protect coronary heart disorder	Hypertension, atherosclerosis, cardiomyopathy, myocardial infarction	64, 89
4	Lungs	Breathing rate increase	Chronic chest diseases, carcinoma, pneumonia, tuberculosis, bronchitis	83,84
5	Liver	Rate of metabolism increase	Fatty liver, liver cirrhosis	19,79
6	Stomach	Higher appetite	Vomiting, gastritis, peptic ulcers	80,81,82
7	Kidney	Increase filtration rate	Renal papillary necrosis, infection-associated glomerulonephritis	93,94
8	Pancreas	Pancreatitis	Diabetes mellitus, carcinoma, diabetes	85
9	Bladder	Non-neoplastic, nonurologic, or genital tract	Cancer	86
10	Breast	Irritability of cancer	Breast cancer	95,96
11	Sex Organs	Reduced their spermatozoa count, increase, Serum LH, FSG, and sex hormone binding globulin levels, Sexual aggression	Males: Loss of libido, impotence Females: Breast cancer, ovary impairment, menstrual problems, infertility	87,88

4.5 Neurocognitive effects and risks

Due to heavy alcohol drinking habits, alcohol prolong persistence period in the brain increase that induces the brain seeks to compensate for its reactive effects. In observational studies of subjects with chronic alcohol use disorders, both left and right hippocampal volumes were significantly smaller than in non-users. Thus long-term memory and remembrance may be affected by prolonged drinking [74] evidentially proof provide by fMRI [74, 75, 91]. Beside that, some studies also suggested that alcohol dependence diminished spatio-visual and motor speed responses. Research shows that alcoholics have a blunted P300 brainwave; that has the peak of the brainwave that could be much lower than in people without an alcohol use disorder [97]. It has been shown that chronic alcohol consumption amongst adolescents may increase feelings of depression because it causes serotonin levels to decrease [98]. Alcohol also stimulates the release of the neurotransmitter dopamine which activates the dopaminergic reward pathway [74]. this could make alcohol addictive, as both short term and long term exposure reinforces this pathway in the brain. Abstinence from alcohol after periods of heavy drinking sensitises N-methyl-D-aspartate (NMDA) receptors causing an influx of calcium ions into neurons as a result of their increased activity. This process has been neurotoxic and causes cell degeneration. Adolescents could found to be less vulnerable than adults to impairment of motor performance by alcohol and as a result, have a tendency to drink much more than normal adults and achieve much higher blood alcohol concentrations before becoming incapacitated. Also, the sedative effect of alcohol appears to be less profound in adolescents compared to adults [75]. This combination of maintaining motor function for longer and experiencing less sedation than adults means that adolescents can have a longer exposure to environmental risks whilst drinking [28]. For instance, younger drinkers may be more inclined to drive a car after drinking or feel that they can climb up a wall and maintenance [99]. However, research on alcohol abusers has found significantly fewer locus coeruleus neurons in the brainstem compared to non-alcohol abusers, suggesting that alcohol may change brain structure and thus trigger a behavioural response [74].

5. Social Consequences

There are many studies which suggested that CAA related with psychosocial complications and interference in day to day functioning include the individual's relationship at home or friends, school & work and legal & social association [100, 101, 102] as illustrated in figure-4. The adverse consequences overlap all vicinity alcohol users. The proportion of injuries linked to alcohol use was estimated to be 58.9 % of all injuries in India. Violent and deliberate injuries were significantly related to alcohol use and from all type of alcohol-related injuries. Alcoholism affects work, studies and plays role in domestic violence. Most of the violence against women is perpetrated by domestic partners, and around 40 % of female homicides are committed by an intimate partner [103]. Alcohol consumption may also serve as a form of self-medication in response to other life stressors, which themselves might directly cause someone to be violent [104]. Alcohol intoxication increase tendency of recurring episodes like frustration, depression, anger, impulsiveness and emotional susceptibility. By increasing aggression due to higher alcohol intoxication [105] and heightening emotional responses, it may increase inter-gender violence [105, 106]. These deviant behaviours or mood disorder proclaim drunkers to be self-focused or self-pleasures character that makes a person to solitary state consequently person slipped into the valley of reluctance. Over months and years of living with many differences and experiencing fights, frustrations, hurt and anger, a couple may seek divorce as the only viable alternative [107].

6. Economics consequences

Alcohol consumption increased by about 55% in India [37, 107] between years 1992 to 2012 that has been the reason India becomes 3rd largest liquor market in the world. The state of Kerala stands first in per capita consumption of liquor at 8.3 litres followed by Punjab 7.9 litres. There were various uprooted reasons that justify alcoholism increase trends in India and highest among young population (60%), rapidly growing consumption due to favoured Western culture, homemade liquor, accessibility [108]. The trends of alcohol consumption in Indian markets shows an inclination towards clandestine laboratories products i.e. county made licit liquor [109]. Low per capita and higher alcohol content in illicit (approx. 56%) with no legal quality-control some of the reasons that justify why people take much illicit liquor rather than branded alcohol available in markets. India's per capita income (nominal) was $1,570 in 2013, ranked at 112th out of 164 countries by the World Bank and most population (153 million) belongs to a middle class. Using World Bank's definition of middle-income families to be those with per capita income between $10 (640 Rs) to $50 (Rs) per day. **(110, 111)** Alcohol policy and taxation deemed a state subject in India, has been a major source of revenue for state governments (Seventh Schedule in state list under Constitution of India) due to the high rate of taxation on alcohol or liquor industries. In most states alcohol has been a significant contributor this accounts for over 10-20% of total state tax revenues [6] whilst in the Punjab this accounts for over one third. A fair assessment of excise revenue has been a pointer towards the cost of management of consequences of alcohol use in India might that the latter would be higher [112] than the total revenue generated from alcohol manufacture and sale Organization Regional Office for South-East Asia. Thus, if all costs were comprehensively examined and calculated for all events, the economic impact would be much higher than the conservative estimate noted above. There were some reasons like wide political support for crackdowns on alcohol, although experts point out that alcohol is a health problem, not a moral one [113]. Higher revenue on alcohol would give its significant contribution to the state treasury, on the face of it, stringency of prohibition policy causes considerable harm to the states exchequers. Hence, since independence, States have experienced ongoing fluctuations in the degree of prohibition adopted at the policy level. **[56]** According to Goods and Services Tax (GST) that was enacted on 1 July 2017 in India which replaced multiple cascading taxes levied by the central and state governments**.** The Government of India excludes taxation over alcohol by categorising these products consumption as predominant social evil habits. This might abruptly vide variety of alcohol at low price rate in markets due to get rid of excise tax on it. However, GST on Tobacco products is 28% with extra 64 -290 % SESE. Due to result, of this group alcohol consumption becomes economical [114, 115].

6.1 Policy measures action taken by Central government

Over 100 countries have laws that regulate their production, sale, and consumption (ICAP) [116]. In particular, such laws specify legally the minimum age to consume alcohol (16-25 yrs) depending upon the nation and the type of drink. Prohibition is incorporated in the Constitution of India among the directive principles of state policy under article 47. [117] During the pre-independence period, Mahatma Gandhi himself issued several strong statements against the sale and consumption of alcohol. In his honour of government of India declared Gandhi Jayanti (October 2) national dry days later extended to Republic Day (January 26) and Independence Day (August 15) during these days sale of alcohol could not be permitted. Most of the Indian states government observes these days on major national festivals and occasions declare by them. Dry days have been also observed on and around voting day.

6.1.1 Alcohol policy is under the legislative power of individual states

Prohibition, enshrined as an aspiration in the Constitution. In India, Mizoram was first (1945) followed by Gujarat (1960), Nagaland (1989), Manipur (2002) and Bihar (2016) were the only states where alcohol has been totally prohibited by law but partial restrictions in Lakshadweep islands and Haryana. Later withdrawn in Haryana and Andhra Pradesh in the mid-1990s, although it continues in Gujarat, with failure of Prohibition in Tamil Nadu further partial restrictions in other states – Delhi, Lakshadweep etc. Increasing taxes as a means of reducing alcohol consumption has been problematic as it could be shown to be unresponsive to price change. Tax increases would be further add to economic hardship for consumers and has little or no impact on the reduction in other negative impacts. There would, however, be an increase in corruption, crime, and the production and consumption of illegal liquor. An important aspect of policy could be to delay initiation among youth by insist on age limits. The legal minimum age to purchase liquor ranges from 18-25 years depends on state. It has, however, been shown that an increase in the age of legal drinking from 18 to 21 years achieves nearly 60% of the effect of prohibition on alcohol consumption [118, 119].

6.1.2 Drinking Drive and Alcohol Commercialisation law

On 1 March 2012, the Union Cabinet approved proposed changes to the Motor Vehicle Act. Higher penalties were introduced, including fines from □2,000 to □10,000 and imprisonment from 6 months to 4 years during violation of drunk and drive law. Different penalties has been assessed depending on the BAC (legal limit is 0.03%) at the time of the offence. Beside the legal policies alcohol manufacturing companies opt vide type of action to build market like favoured the liquor and rely public advertisements to allure widest range of youngster and mope for larger production and benefits. In order to, direct further Government of India prohibited advertisement of alcohol and cigarette products under Cable Television Network (Regulation) Amendment Bill, in force September 8, 2000. The government-controlled National channel like Doordarshan, does not broadcast such type of advertisements by making three controlling agencies like PCI (1987), CTRA (1955), ASCI (1985) but satellite channels however could replete with them.

7. Discussion

Alcohol is one of the commonly consumed intoxicating substances in India [120, 121]. It has been traditionally drunk in

ancient cultures and tribal societies [6, 121] Although it has been won increasing social acceptance among other groups, urban males are the prime example. It could be easily available and widely used, especially at festivals such as Deepawali and Holi and cheerful moments [122, 123]. It was estimated that of these 5% population (>5% million) can be classed as alcoholics or alcohol dependent. In spite of that Intake of IMFL has been growing at the considerable rate of 15% per annum related to previous data. These alarming figures show great burden over Indian population to cope up adverse consequences (short and long-term) of alcohol intoxication shown in Table 4. People have been reported that symptoms like feeling bad (22%), active in illegal activities (14%), aggression (26%), domestic violence (19%) and involved (9%) in suicidal attempts [5]. These individuals with a family history of alcoholism might be reported dysfunction in the activity of the hypothalamic–pituitary–adrenal (HPA) axis that could be predates the development of alcoholism.(124) The chronic heavy use of alcohol induces deviant adverse effect over on different body organs that insist structural, molecular as well as mechanistic alteration (shown in Figure-1). However, use of alcohol has been frequent among women who also tend to resist the habit among male family members that results into favoured environment for alcohol use. The parental alcohol use could be influence a child by genetic or prenatal means or by its impact on the child's environment. (125, 126,127) The persistent mental retardation has been the major sequelae of intrauterine alcohol exposure in many cases, and environmental and educational factors do not have strong compensatory effects on the intellectual development of affected children.(128) Researchers have been identified and classified a wide variety of adverse consequences for people who drink and their closet bond like families, friends, co-workers, and others they encounter [129, 130, 131, 132] Patterns of alcohol consumption also increase the risk of violence and the likelihood that aggressive behavior will escalate. [133, 134, 135, 136, 137] These compensational closet might trigger mechanism cognitive and neurobehavioral deficits like depression, anxiety, impulsiveness, aggression, agitation [5, 9, 10, 26, 27] and these behaviour disorder tends to counter legal laws as shown in the figure 4. A drunker with these disorders lacks conditional reactive responses and do that most of time accomplished with failures, hatred that might trigger the process of impaired decision making. With these outcomes drinkers start thinking for permanent solution of pain, hurdles and mostly drinkers commence to think about suicidal ideation, suicidal ideation into action and also provide motivation to carry out a suicidal attempt, suicide (138) and criminal intends [31, 32, 33, 34, 35, 36]. However, wide adverse calculating effects of alcohol, it's become fatal or amplified with tobacco, cocaine and other synergistic agents [41, 42, 43, 44, 45]. This abnormal behavior induce by alcohol intoxication, could plays vital role social interaction like domestic violence, divorce-related issue, accidental tragedies as well as alcohol induce sexual as well as homicidal, suicidal criminal tendency. Many studies reported that both perpetrators and victims of violent crimes were likely to have consumed alcohol prior to certain aggressive acts, such as rape, assault, domestic violence, and murder [139, 140, 141, 142]. Since ancient period, with this gigantic aura that induces by alcoholism on various life strata of individual and its province, eradication of alcohol consumption and use is still a social evil. Because, alcohol remains one of the most important sources of revenue for most states its use attracts considerable social opprobrium [6, 57]. This condition provides environment to high levels of corruption and inadequate law enforcement the efficacy of prohibition policies have also been called into question. While the rich have continued access to alcohol, the poor resort to illegal brews, with a consequent increase in bootlegging and deaths due to methanol poisoning [143]. The risk of such consequences for the individual varies widely and depends on the situation. However, researchers have found a general trend toward an increased risk of adverse effects on society as the average alcohol intake among individual's increases [144, 145].

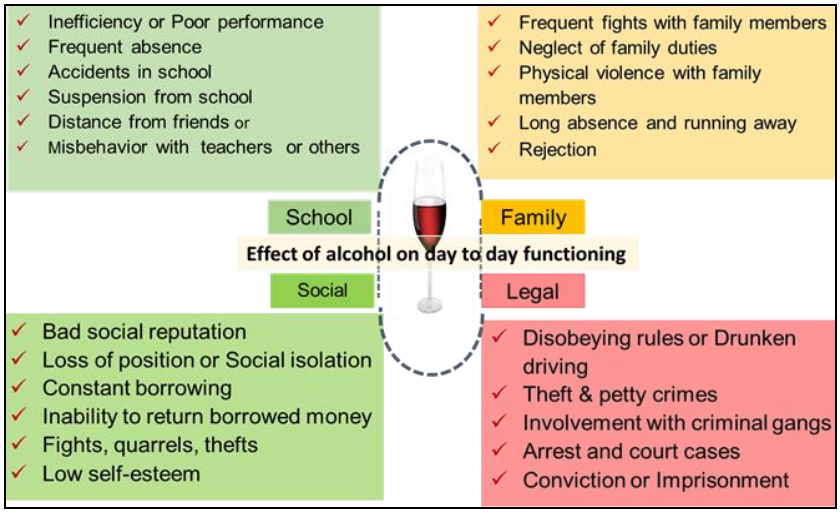

Fig 4: Demonstrates adverse consequences of alcohol consumption on routine social and legal operation

Alcohol-related problems include economic losses resulting from time off work owing to alcohol-related illness and injury, disruption of family and social relationships, emotional problems these all factor impact on the perceived health of individual as shown in Figure 5.

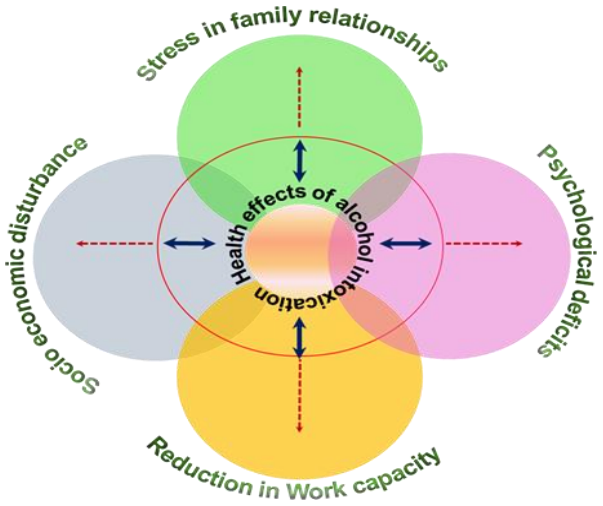

Fig 5: Alcohol induce consequence there effect on health of individual consumer and on his vicinity

Alcohol use has been associated with increased risk of injury in a wide variety of circumstances, including automobile crashes, falls, and fire [146, 147, 148, 149]. However, in order to encounter economic, health social adverse effects regulatory agency should new laws that govern all aspects of alcoholism its effects. The evidence showed a dose-response relationship between intake and injury risk and found no level of drinking to be without risk [150].

8. Conclusion

The focus of this work was a review of reviews interlinked factors that riddle with adverse effects on human social, economical as well as behavioural due to CAA. It was cleared that many of the reviews in this field were now quite old convergent to one variable by excluding another variable. However, this reviews unique in its class, in order to produce a wide range of variable and their correlation with consequences of alcoholism. The majority of the studies found related to adolescents and college or university students but selective studies were carried out to focus on labour class, automobile drivers, a divorcee and aggressive prisoners further opted with weak methodology and so it could not be possible to have a high degree of confidence about their conclusions. In addition, there was a repeated theme in this body of work in which correlations were reported for a wide range of personal (health), familial and social factors and alcohol misuse. However, it was generally not possible to determine that exact key risk factors 'caused' alcohol misuse or that the latter specifically led to the adverse effects. Further to this in the main, it was not possible to ascertain the levels of alcohol that led to adverse consequences as was the hope of the results of this review of reviews. A distillation of the findings might suggest some possible reasons that intensified alcoholism effects on Indian population summarised in Table-5. In order to reduce adverse health effects some countries increased taxation that has been used to reduce consumption. In India, the impacts of such measures have been weak as consumers have easy access to undocumented and illicit alcohol and substances. We identified no work that reported specific levels of alcohol consumed in terms of standard drink units or blood alcohol count with respect to Indian scenario. Thus from the research to date, it is not possible to link different levels of alcohol consumption to different outcomes. Hence with a view to the formulation of recommendations about alcohol risk reduction for children and young people, it could not be easy to conclude that drinking to differing degrees will produce commensurate effects. However, the present regulatory laws and alcohol policy in India should need to review again laws that cover comprehensive understanding of the various dimensions of the problem. The final remarks are that more research will need that might suggests interlinked factors between alcohol intoxication and deviants behaviour like depression, aggression, impulsivity or criminal intention. These abnormal behaviours would provoke in domestic, accidental as well as wide ranges of criminal activities that will contribute towards economic and social losses.

Table 5: Some possible reasons that intensify adverse effect on Indian population

S. No	Factors	Indian drunkers condition	Inferences
1.	a.) Biological Factors		
	1.) ADH Activity	Due to a point mutation, aldehyde dehydrogenase-2 (ALDH2) isoenzyme is deficient in 30% to 50% of Asians	Much more time retainment of alcohol metabolites in body fluids
	2) Hormone Susceptibility (Fluctuation)	Higher hormonal fluctuation due to environmental and mental stress	More susceptible health towards drugs and alcohol
	3.) Health condition	Higher depression rate, higher diabetic ratio	Weaker than another ethnicity due to improper of food habits
	b.) Genetic factors	CYP2E1, ADH1B*2, ADH1B*3, as well as catalase polymorphism	Low ADH activity leads to more toxic effects on health
	c.) Psychological Factors		
	1.) Extrovert /Introvert nature	Overdrinking changes introvert to extrovert attitude and vice-versa	Most of the individuals need much psychological counselling
	2.) Brain IQ	Over drinking habits damage frontal as well as temporal lobe functionally and HPA axis	Frustration, self-guilty, incapacity to resolve problems
	3.) Creativity and ideas	Depressed thinking capacity by triggering lower down mechanism	Impaired mental capacities
	4.) Personality	Much higher rate depressive symptoms than another ethnicity	This might leads to infringing of positive thoughts
	5) Anxiety and aggression	Much higher anxiety and aggressive behaviour	Higher domestic violence
2.	Family factors		
	1.) Family negligence /restriction	Bounded by cultural rules, spiritual rituals, castism	----------
	2.) Stress in relation	Sentimental or emotional disturbance	Higher chance of relationship breakup
	3) Over Expectation	More optimistic	Overwhelming
	4.) Moral support	Less moral support	Loneliness, frustration
	6.) Money monitoring	Improper/low monitoring	Freedom to uses surplus money accordance own will
3.	Social Factors		
	a) Religion	Hindu, Sikh, Muslims Christian	Highest ratio of drinking in Shikh and Hindu religion
	b)Cultural rituals or occasions	Holi, Diwali, Baishakhi, Christmas, other occasions etc.	High trends towards alcohol consumption on festival occasion
	c.) Population burden	Highest (> 1.25 billion)	Highest Competence strugglance
	d.) Awareness	Moderate or poor in villages	High use of illicit liquor by villagers or labour class
	e.) Availability of drink	Easily and economical	High per capita consumption in villages
	f.) Weak Policymaking	Weaker policy and less implementation due to high revenue	Frequent growing of alcohol markets
	g.) Healthcare Index	154th among 195 countries	Lower than other countries
	h.) Poverty index/ Human Development Index (HDI)	131 among 188 countries in reference to longevity, knowledge and a decent standard of living	Standard of living in a country or extent of deprivation
	i.) Corruption/ Corruption Perceptions Index	79 in 175 countries	Adversely affects the country's economy and the credibility of central, state and local government agencies
4.	Environmental Factors		
	a.) Temperature	High/ Moderate /coolest	Metabolic rate
	b.) Altitude	High and Moderate	----------
	c.) Humidity	High and Moderate	---------
	d) Air quality index	Poor (201-300) in larger cities	Lungs related problems

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Conflicts of interest
All authors declare that they have no conflict of interest.

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