

## Alcohol Consumption and its Harms to Humans

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**Abstract:** The aim of this paper is to review the harms of alcohol consumption on first-hand users, and relations. Alcohol affects all parts of the body leading to several effects and harms on users and non-users. Alcohol affects mental health, and impairs judgement and concentration; in fact, long-term use of alcohol can damage the brain and nerves of humans. Lungs infection is increased by alcohol, while heart is hurt by alcohol. Liver can be damaged by alcohol use, pancreas is affected by pancreatitis, stomach and oesophagus are also victims of alcoholism. Alcohol can cause cancer on intestines, injury on bones and muscles, and cancer of breasts. Alcoholism causes unwanted sexual behaviors and can affect reproductive health. There are diverse array of measures to be taken to control the harms of alcohol, including: leadership commitment, legislation, healthcare services improvement for users, creation of awareness among the public, and community actions.

**Keywords:** alcohol, alcoholism, cancer, liver, hepatitis, HIV, anxiety, miscarriage, still birth.

### INTRODUCTION

Alcohol (ethanol or ethyl alcohol) is the substance found in beer, wine, spirits, which causes drunkenness. It is formed when yeast ferments sugars (grapes, potato, beets, grains) in the absence of oxygen (Alberta Health Services, 2014). Presently, alcohol remains the leading global risk factor in the global burden of diseases with highest impacts of injuries and diseases (Andreasson *et al.*, 2016). Alcohol affects human physiology, anatomy, and other aspects of the body. It has been linked with 230 ICD-10 (International Classification of Diseases, 10th edition) diseases. Alcohol has been regarded as a crucial factor in deaths due to infectious diseases, intentional and unintentional injuries, digestive diseases and several non-infectious diseases. For instance, alcohol has been attributed in cancers of oral cavity, pharynx, larynx, liver, oesophagus, stomach, breast, colon, and rectum. It is known to exacerbate worse outcomes in HIV, Tuberculosis and others. In other facets, alcohol is linked to social impacts such as accidents, injuries, familial discord, and burden on criminal justice system, and economy (Anderson *et al.*, 2011; Monteiro Vieira *et al.*, 2018; World Heart Federation, 2020).

Biochemically, alcohol is very soluble in water (owing to its polar nature) giving it ability to traverse easily into all organs of the body to cause many effects. In most of the tissues of humans, there are enzymes capable of oxidizing/metabolizing ethanol, but a significant metabolism takes place in the liver or stomach. When ingested, alcohol is initially absorbed by the stomach with a speed dependent on the presence or absence of food (food reduces digestion of alcohol). When alcohol reaches the liver, it is processed/metabolized and absorbed. After distribution, metabolism of alcohol happens using 3 enzymes, namely, alcohol dehydrogenase (ADH), cytochrome P450 and catalase, with ADH as the most active. Initially, class 1 ADH converts its substrate to acetaldehyde (a toxic metabolite), which is converted to acetate by aldehyde dehydrogenase (ALDH) (which is located in the mitochondria). The product acetate is converted to acetyl CoA, releasing the final products as carbon dioxide and water. The aim of this paper is to review the harms of alcohol consumption on first-hand users, and relations (Monteiro Vieira *et al.*, 2018).

**Table 1:** Selected Harms of alcohol consumption on humans as reported by past studies

Short-term effects	Long-term effects
Injuries Motor vehicle crashes Falls Drownings Burning	Chronic diseases High blood pressures Stroke Heart disease Liver disease Digestive problem
Violence Homicide Suicide Sexual assault Intimate partner violence	Cancers Breast Mouth and throat Liver Colon and rectum Oesophagus Voice box
Alcohol poisoning	Learning and memory problems Dementia Poor school performance
Reproductive health effects Risky sexual behaviors Unintended pregnancy Sexually transmitted diseases Miscarriage Still birth Fetal alcohol spectrum disorders	Mental Health Depression Anxiety
	Social problems Family problems Job-related problems Unemployment
	Alcohol use disorders

Source: Centers for Disease Control and Prevention (2021)

**Some Toxic Alcohols**

There are more many alcoholic substances which are toxic to the human body as mentioned below:

**Ethanol**

Ethanol is a low molecular weight hydrocarbon widely present in beverages, food extracts, cough syrup medications and mouthwashes (Ekka and Agarwal, 2015). Ethanol is rapidly absorbed and reaches peak at about 20-60 minutes after ingestion. It is converted to acetyldehyde, then to acetate, and ultimately to carbon dioxide and water.

**Isopropanol**

Isopropanol is a clear, colourless liquid characterized with fruity odour and mild bitter taste. It is commonly found as rubbing alcohol in cleaners, disinfectants, antifreezes, cosmetics, solvents, inks, and pharmaceuticals. Isopropanol is rapidly absorbed by the body and reaches peak in 30 minutes after ingestion. Then converted to

acetone by alcohol dehydrogenase enzyme (Alcohol Advisory Council of New Zealand, 2019).

**Ethylene glycol**

Ethylene glycol is a colourless, odourless, sweet substance used as antifreeze, de-icing agent of solutions. Ethylene glycol produces toxic byproducts that are harmful to the human body. Glycol aldehyde is produced from ethylene glycol through the action of ADH, which is then converted to glycolic acid, then to glyoxylic acid (Alcohol Advisory Council of New Zealand, 2019).

**Effects of Alcohol on Various Parts of the Body**

Several effects on the human body due to alcohol have been documented. Some of the effects on diverse organs of the body are listed below:

**Bones and muscles**

Immediate effects of alcohol on bones and muscles are: lead to injuries such as cut, bruises, sprains, and broken bones etc. Chronic heavy use interferes with calcium absorption, bone formation. It causes osteonecrosis, gout, muscle wasting and weakness (Rehma *et al.*, 2002)

**Blood and immune system**

Chronic use of alcohol cause blood abnormalities such as anaemia, low platelets, and effect white blood cells. People who are heavy drinkers are more likely to suffer from HIV, hepatitis, burns, meningitis, tuberculosis, and pneumonia (Alcohol Advisory Council of New Zealand, 2019).

**Brain and nervous system**

Immediate effects of alcohol use are: it impairs judgement, concentration, causes drowsiness, coma, and loss of memory. Long-term effects of alcohol use on brain and relations are: damage brain and nerves (because alcohol reduces absorption of vitamin B1. Thiamine deficiency can cause Wernicke's encephalopathy, chronic memory loss (in dementia); Korsakoff's syndrome, psychosis, difficulty in laying new memories, damage cerebellum, peripheral nerves damage, stroke.

**Stomach**

Immediate effects of alcohol use on stomach are: nausea, vomiting, diarrhea, and heart burn. Long-term effects of alcohol are: cancer of oesophagus, chronic gastritis.

**Skin and Fat**

Acute use of alcohol can cause skin flushing, and bad appearance of skin. Chronic use cause yellowing of skin, hair loss, weight gain.

**Reproductive system**

In male, drinking increases the risk of unsafe sex, sexual assault. In chronic use, alcohol lead to impotence, loss of sex drive, wasting of testicles and low fertility. In females, alcohol use increases unsafe sex, and assault. Chronic use lead to

reduced fertility, irregular periods, still birth, miscarriage, premature birth, and defects in the unborn.

**Lung**

Immediate alcohol use increases the risk of pneumonia, bronchitis. Long-term use is associated with higher rates of pneumonia, and acute respiratory syndrome.

**Mouth and throat**

Drinking affects speech, it cause aggressiveness, angriness, confusion, and slurring

**Heart and Blood pressure**

In chronic use, alcohol causes angina, and heart attack, chronary heart disease, sudden death

**Eyes**

Drinking can cause blurred or double vision

**Breasts**

In women, chronic use increases the risk of breast cancer.

**Liver**

Chronic use causes hepatitis, cirrhosis in liver

**Kidney**

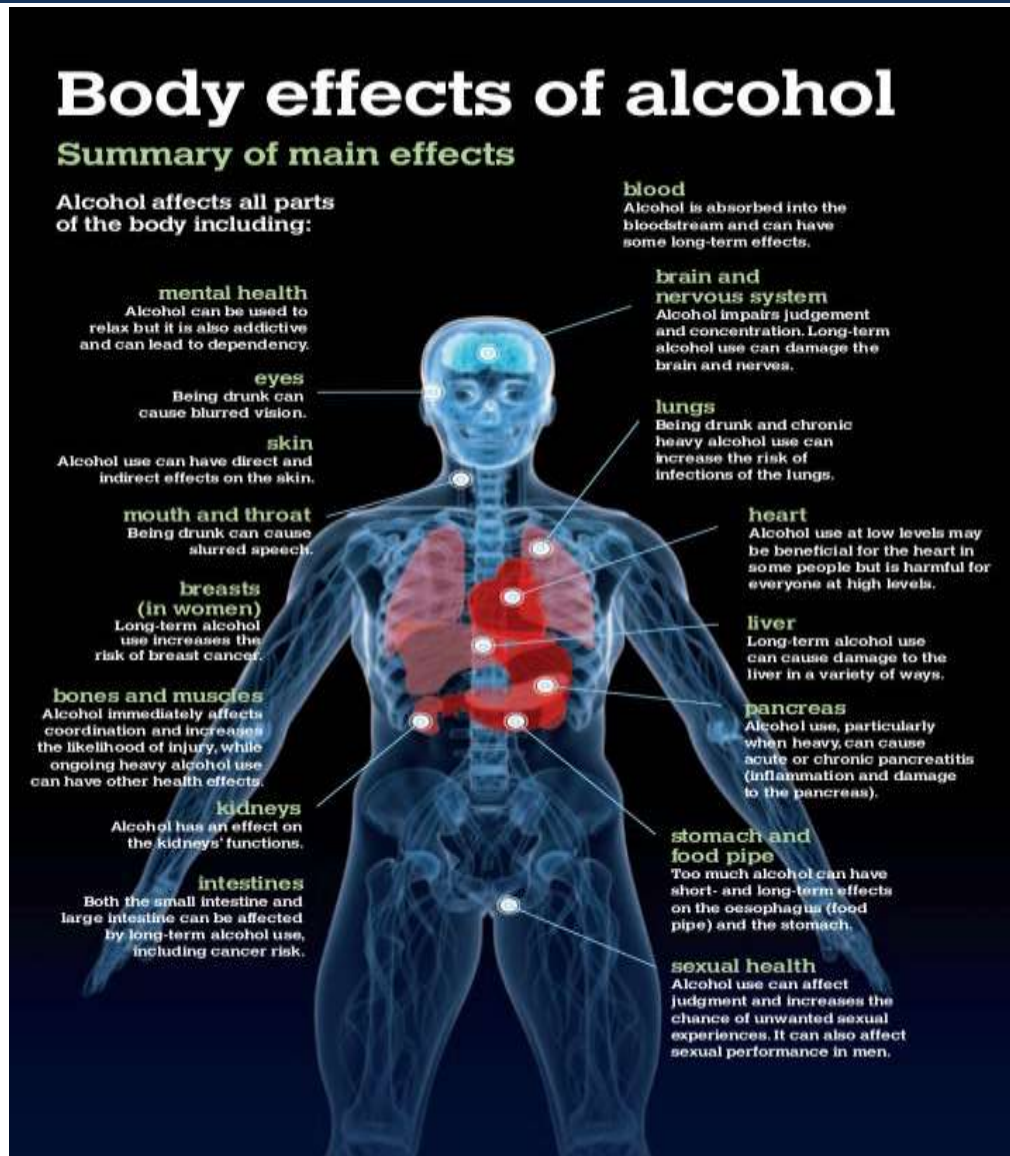
Alcohol causes dehydration by acting as diuresis. It can also cause loss of magnesium, calcium, phosphate, Sodium, etc through vomiting

**Intestines**

Chronic use enlarges intestine, and rectum. It causes malnutrition because it blocks absorption of nutrients.

**Pancreas**

Heavy drinking cannelled to hypoglycemia, inturn causing dizziness, shaking, sweating, blurred vision in severe cases brain damage. It can also lead to pancreatitis (Newbury-Birch *et al.*,2009; Kaptein *et al.*, 2013; Substance Abuse and Mental Health Services Administration, 2018; Alcohol Advisory Council of New Zealand, 2019).



**Figure 1:** Summary of effects of alcohol consumption on human body, Source: (Alcohol Advisory Council of New Zealand, 2019).

### Control Measures

Several measures to reduce alcohol consumption are reported by studies and experts as enumerated below:

### Legislation

There should be legal framework to regulate production, distribution and drinking of alcohol from the international level. The other tiers of governments should also follow suites to enact and implement appropriate laws that control the alcohol production, distribution, and use among its citizens. Parable, banning of alcohol beverages, implementing penalties for sales of alcoholic drinks, introduction of alcohol registration system, zero tolerance to alcohol for drivers, banning of alcohol advertisement, etc (World Heart Federation, 2020).

### Leadership commitment

Leaders must demonstrate leadership and appropriate commitment in order to meaningfully reduce harms from alcohol consumption. They do their commitment by making policies, pooling of funds and implementation of policies appropriately and honestly (World Heart Federation, 2020).

### Creation of awareness on the dangers of alcohol

Education has a significant influence on substance abuse. People who are aware or educated on the dangers or effect of substance abuse are more likely not to indulge in substance abuse than people who are not aware of the dangers involved. Proper and effective education on dangers of substance or drug abuse should be taught in school and at home by teachers, parents, and guardians. Online and offline media are essential in drug

abuse campaigns more especially during this time of youths engagement in social media platforms. Mass media involve the use of newspapers, radio, television, magazine and the internet. Media campaigns have been widely used for the prevention of substance abuse and illicit drug use especially among young people (National Institutes of Health, US Department of Health and Human Services, 2009; World Heart Federation, 2020; Ojiaku and Nwokoro, 2021).

### Health services response

Drinkers should be given appreciate responses, treatments, and interventions for the alcohol consequences they suffer with. There should be appropriate rehabilitation systems to cater for people with alcohol use or addiction (National Institutes of Health, US Department of Health and Human Services, 2009; World Heart Federation, 2020).

### Community actions

Governments and other stakeholders should support community action where a person lives to take alcoholism problem as everybody's business. Communities should make alcohol a taboo, and unwanted substance; this will restrict many people from engaging in drinking. There should also be proper community interventions to cater for rehabilitation of drinkers (National Institutes of Health, US Department of Health and Human Services, 2009; World Heart Federation, 2020; Henry *et al.*, 2021).

### Increasing Alcohol Taxes

Alcohol taxes may include wholesale, or sales taxes, all of which affect the price of alcohol. Taxes can be levied at the federal, state, or local level on beer, wine or distilled spirits. Consequently, this will make it hard for many users to access drugs, while lack of accessibility help to scuttle an urge to take drugs (CDC, 2022; Dikko *et al.*, 2022).

### Dram Shop Liability

Dram shop liability, also known as commercial host liability, refers to laws that hold alcohol retail establishments liable for injuries or harms caused by illegal service to intoxicated or underage customers (CDC, 2022).

### Electronic Screening and Brief Intervention (e-SBI)

e-SBI uses electronic devices (e.g., computers, telephones, or mobile devices) to facilitate delivery of key elements of traditional screening and brief interventions. At a minimum, e-SBI involves

screening individuals for excessive drinking, and delivering a brief intervention, which provides personalized feedback about the risks and consequences of excessive drinking (CDC, 2022).

### Religious measures

Religion can be seen as a shared set of beliefs and practices that has been developed in community with people who have similar understandings of the transcendent, which is designed to mediate an individual's relationship with God or the transcendent. As such religion can be a protection against some of the social behavior such as youth involvement in substance abuse. People who actively indulged in religious activities are less likely to indulge in drug abuse. This could be due to the fact that the time spent engaging into religious activities translates into less available time for antisocial activities such as drug abuse (Nasiru, 2015).

### CONCLUSION

Certainly, alcohol consumption affects human body in entirety, more especially the vital organs including the pivotal liver. The effects of alcohol transcends the user, and befall on other social aspects and members of the society in several ways. For instance, it elicits accident, increase in crime, reduced economy, healthcare expenses, etc. Therefore strict measures have be followed to control human alcohol consumption.

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