



UNIVERSITY OF PADOVA
Department of General Psychology

**Bachelor's Degree Course in Psychological
Science**

Final Dissertation
**Clinical and Psychobiological Aspects of
Alcohol Addiction**

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Preface

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Clinical and psychobiological aspects of alcohol addiction

What is addiction?

Addiction is a not simple thing but a complex disease, the decades of research and publication of scientific studies has helped many people in getting a deeper understanding about the nature of addiction and its impact. These findings has resulted in changes regarding how we think and discuss about addiction: Addiction is now classified as a disease that affects the brain, not just a personal failing or choice.

The American Society of Addiction Medicine defines addiction as a chronic medical disease that involves complex interaction among brain circuits, genetics, the environment, and an individual's life experiences but it is considered treatable. People who have problem with addiction use substances or engage in behaviours, which becomes compulsive but continues despite its harmful effects.

A chronic disorder with biological, psychological, and Socio-environmental factors influences its overall development. Genes certainly affect the intensity of reward that individual's experience, when initially using a substance or engaging in certain behaviours like gambling. The heightened desire to re-experience reward of the substance or specific behaviour is probably influence by psychological, social and environmental that can lead to regular use, with chronic use or exposure that can lead to brain changes.

These can lead to alteration in the cortical and sub cortical regions of brain that are involve in neuro-circuitry of reward, memory, impulse control and judgement. It can result in the increase of cravings for a drug or activity, as well as it can hinders one's ability to regulate this impulse, despite the experience and knowledge of many consequences related to the addictive behaviour.

Drug addiction and drug misuse are two different things and we must not confuse them with each other. Misuse refers to the misuse of a substance at high doses or in inappropriate situations that could lead to health and social problems. However, remember that everybody, who misuses a substance, can have addiction. Addiction is a "fact or condition of being addicted to a particular substance, thing, or activity." To give an example, a person who drinks beer heavily on a night out may experience both the euphoric and harmful effects of the substance. However, this is not qualified as an addiction until the person experiences "chronic, relapsing disorder characterized by compulsive drug seeking and continuation despite harmful consequence, and long-lasting changes in the brain."

All the different types of drugs can be categorised under **two category of sedative-hypnotic** drugs like alcohol, general anaesthetics and benzodiazepine **and the drugs that stimulate brain** functions like cocaine, caffeine and nicotine. The sedative-hypnotic drugs are drugs that can affect neurons so that the functioning of the brain is inhibited, resulting in a behavioural state of calm, relaxation, disinhibition, drowsiness, and sleep as doses of drug increases.

These agents are ingested to ease anxiety, tension and agitation to induce a soporific state. Today, most recognizes two kinds of addiction:

- **Chemical addiction.** This refers to addiction that involves the use of substances.
- **Behavioural addiction.** This refers to addiction that involves compulsive behaviours. These behaviours are carried out even if they do not offer any real benefit.

How addiction supposedly works

It is helpful to understand a few general elements of addiction before discussing the different types of addiction.

The reward system

Addiction interferes with the normal functioning of brain, particularly in the reward system. When you find something enjoyable, like hanging out with your best friend, drinking a bottle of vintage wine, or taking cocaine, our body's reward system releases the neurotransmitter dopamine along with other chemicals. Dopamine does not actually cause feelings of pleasure or euphoria that is opposite to the common belief but instead, it reinforces one's brain that associate between certain things and pleasurable feelings that drives them to seek those things out again.

Cravings and tolerance

Our desire to experience this reward again triggers cravings for the specific substance or behaviour, especially when you encounter the same situation like a dark alley where you have taken the substance in the past. This craving is the first sign of addiction.

When we continuously use the substance intake or engages in a behaviour, our brain continues to produce high level of dopamine. Ultimately, there will be plenty of dopamine in the brain and that would cause less production in response to normal trigger. Unfortunately, one problem is your brain reward system still needs the same amount of dopamine to have the same effect. Therefore, you need to use higher doses of the substance to compensate to make up for what the brain is not able to produce. That effect is called tolerance.

Reduction of interest in other activities

When the addiction gets stronger then it is very common to lose interest in normal and simple things that you use to enjoy in the past. This is due to the simple reason that our brain does not produce much amount of dopamine in response to simple triggers like painting or cooking something or making love. Even if someone decides to stop using these drugs or engaging in those behaviours, one still might have the need of them in order to just feel good about many things.

Loss of control

When you have addiction problem then it usually involves our inability to control substance use or specific behaviours. This might have many dire consequences like loss of job, relationship with friends and family member and dilapidation in both physical and psychological health. May times, when one realizes it and try to mend it, it is quite often too late.

What do we know about chemical addiction?

Chemical addiction can be quite difficult and tricky to talk about because there is often disagreement and discussion about what constitutes substance misuse, dependency, and addiction. This is also in some reason why the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (**DSM-5**) suggest using the term “substance use disorder.” This classification criteria was aim to help healthcare professionals differentiate between severity of the cases from each other. Nowadays many experts avoid term as “abuse,” in order to prevent stigmatisation of people that have addiction and to make sure that can prevent them from not seeking. Some of the Common symptoms of chemical substance addiction include:

- Intense craving that affects one’s ability to think about other things

- Increase need of the dosage to experience the same effects
- Physical discomfort and reaction if substance is not accessible
- Use of these substance while driving or working
- An inability to stop using the substance even after seeing its harms
- Many experience intense withdrawal symptoms while trying to quit

Some of the more common addictive substances include:

- alcohol
- opioids, including both heroin as well as prescription pain killer like oxycodone and morphine
- cannabis
- nicotine
- amphetamines
- cocaine
- methamphetamine

What is behavioural addiction?

There is some disagreement around the concept of behavioural addictions regarding whether a particular behaviour truly involve addiction or not. However, the DSM-5 now recognizes two types of behavioural addictions:

- gambling addiction
- internet gaming disorder

Even though, most of the medical experts agree upon the fact, that certain behavioural pattern can become problematic over time, but there is still some discussion and debate around it.

- the point when behaviours actually become addictions

- specific behaviours that can become addictive

For example, many people might agree that shopping, pornography and exercise addiction exist but might doubt and question the idea that people can become addicted to twitter.

The APA chose not to include some of these behaviour patterns in the DSM-5, due to lack of rigorous scientific research and peer-reviewed evidence that is necessary for standard criteria of any diagnosis. So therefore, as a result, there is no official diagnostic criteria.

However, general signs of a potential behavioural addiction include:

- spending incredible amount of time engaging in behaviour
- intense urges to engage in the behaviour despite its negative effects in daily life
- using the behaviour to manage unwanted emotions
- hiding the behaviour or lying to others about the duration of time spent on it
- difficulty in avoiding the behaviour or intense withdrawal while attempting to quit
- compulsion to continue the behaviour despite causing huge distress

Some of the common behavioural addictions people often seek therapy and other professional support to address include:

- shopping addiction
- Sex and pornography
- exercise addiction
- food addiction
- TV addiction
- Social media addiction

Alcohol in Historical and cultural context

Fermented grain, barley and fruit juice have been used to make alcohol (ethyl alcohol or ethanol) for thousands of years. It existed in early Egyptian civilization, Sumerian culture and there is evidence of an early alcoholic drink in China around 7000 B.C. In India, an alcoholic beverage called sura, distilled from rice, was in use between 3000 and 2000 B.C.

The Babylonians even used to worship a wine goddess as early as 2700 B.C. In Greece, one of the first alcoholic beverages to gain popularity was mead, a fermented drink made from honey and water. One can also find a lot of warning in Greek literature against excessive drinking.

Many Native American civilizations developed alcoholic beverages in pre-Columbian times. Many different varieties of fermented beverages from the Andes region of South America were made from corn, grapes or apples, called "chicha."



In the sixteenth century, alcohol (called "spirits") was used largely for medicinal purposes. At the beginning of the eighteenth century, the British parliament passed a law encouraging the use of grain for distilling spirits. In Britain, gin consumption reached 18 million gallons and alcoholism became widespread.

The nineteenth century brought a change in attitudes and the temperance movement began that try to promote moderate use of alcohol that ultimately became a push for total prohibition later.

What is alcohol addiction?

Alcoholism is the most severe form of alcohol abuse and involves the inability to manage drinking habits. It affects people from all works of life and experts have been trying to pin point to various factors like genetic, sex, and race or socioeconomic that might have been the cause that are some sort of predisposition in people becoming alcoholic.

Alcohol use disorder is put under three categories: mild, moderate and severe. Each category has various symptoms and can cause harmful side effects. If left untreated, naturally any one of three types can spiral out of control.

The term alcohol refers to ethyl (ethanol), a psychoactive drug that is similar to all the other types of sedative hypnotic compounds that are mostly similar in nature. However, ethanol is used as recreational rather than medical purpose unlike other depressants but it is like any psychoactive drug that affects the brain and behaviour. Therefore, it is very important to

understand the Pharmacology as well as its harmful side effects, teratogenic effects and its toxicities.

Individual people struggling with alcoholism often feel as though they cannot function properly without alcohol. This can result in wide range of issues and it negatively influences one's personal and professional life and overall health. Over time, the serious side effects of consistent alcohol abuse can worsen and produce damaging physical and psychological complications.

Traditional use of alcohol as treatment in 18th and 19th century

When you try to imagine a healthy lifestyle and diet, a daily dose of booze is not necessary thing that springs to mind as a daily regimen. However, throughout much of history, people have also turn routinely to alcohol for its supposed medicinal benefits.

We have witness in many recent publications about how in the 18th century, it was widely used in many part of the world not just as a curative, but also as a preventative measure. Actually, in the ancient time, in the area where there was scarcity of drinking water, alcohol was often consider as the safest and best options that is most accessible and effective in the restoration of one's health. Alcohol was not just an elixir of the Enlightenment. Whether it was in an ancient Egypt that someone has a tummy ache, a medieval monarch with a catching cough, or Renaissance Italian with a dash of dyspepsia, the odds are quite high that doctor might prescribe spirits to cure whatever ailment you have.

In the 18th century, alcohol was not only consumed for fun or as a medicine when you have fallen sick but it was also considered as an effective preventative measure of a disease. In particular, it is thought to be a safer alternative to water in many places. Moreover, that has a good reason, as water supplies in the 1700s were not exactly state-of-the-art in many parts of Europe. Waterborne diseases were very common and deadly. Therefore, alcohol was a good alternative to keep away from the contaminated water.

During the time when America was formed, it was commonly accepted thing that alcohol was healthy. It was consider keeping our body warm and helping in digestion. It was used to treat things such as colds and fevers and it was even used to sedate women during labour.

The late eighteenth century physician named **Benjamin Rush** argued that the acceptance of the use of alcohol caused alcoholism and recommended to use cold water instead of alcohol. He was the first physician to recognize alcoholism as an illness. However, it was still continuously used for medical purposes. It was even use as a painkiller during the surgery in mid-nineteenth century, over time, other painkillers, such as narcotics and chloroform became available too but most patient preferred the use of alcohol.

Around the time 1700s rolled, humans had been already using alcohol for medicinal purposes for so long; it was believed to help ward off every types of disease from the plague to parasites. If you had a sore throat or were worried about something a lot more serious, like cholera, then a shot of whiskey or a snifter of brandy was believe to help.

Alcohol was also thought to help in digestion, help the body fight pneumonia, revive a person in a state of collapse from shock. Port was given to help convalescing patients recover faster, and alcohol was given as both sedative and a pain reliever to those suffering from “nervous” conditions.

For hundreds of years alcohol claimed a prize place among the pills, potions and healing herbs of British pharmaceutical history too. A drop of gin was given to ward off the plague, a wine to "defend the body from corruption" and a gulp of absinthe to treat body of roundworms. According to the translation of early books from Roger Bacon, a 13th Century English philosopher, writer and alchemist suggests, wine can increase body heat, preserve stomach and help in digestion. It can defend the body from corruption; concoct the food until it be turned into blood. He have also recognised the dangers of excess consumption of ethanol to do more harm than benefit for it will cloud our rationality, harm our brain and lead to shaking of limbs and bleareyedness.

According to Dr James Nicholls, of Alcohol Research UK, by the 18th Century a growing number of people considered spirits such as gin a major cause of drunkenness, poverty and crime. The first documented petition by the Royal College of Physicians expressing the concerns about the dangers and growing use of spirituous liquors was made in 1725, yet it was not until the 19th Century that alcohol was regarded as a problem in a consistent way.

Epidemiology of alcohol addiction

Alcohol use disorders are among the most prevalent mental disorders worldwide. Alcohol use disorders are highly disabling and associated with many physical and psychiatric comorbidities; they also contribute substantially to global mortality.

Alcohol use disorders impair productivity, disrupts interpersonal functioning, and place psychological and financial burdens on those who misuse alcohol, on their families and friends. Under its influence, they are vehicle accidents, violence, and criminal acts that are all very heavy price to pay. Alcohol has always hold an important role in different culture in their social engagement and bindings. Social drinking or drinking with moderation for many people is normal and pleasurable too.

However, excess alcohol consumption is linked to a number of negative outcomes: as a risk factor for diseases and its health impacts, crime; road accidents and for some, total alcohol dependence. Globally alcohol consumption causes 2.8 million premature deaths per year.

Alcohol consumption across the world today

The interactive map below shows the annual average alcohol consumption per person among aged 15 years or older. To account for the differences in alcohol content of different alcoholic drinks, reported in liters of pure alcohol per year.

To make this average more understandable we can express it in bottles of wine. Wine contains around 12% of pure alcohol so one litre of wine contains 0.12 litres of pure alcohol. The global average of 6.2 litres of pure alcohol per person per year therefore equals 53 bottles of wine per person older than 15. Alternatively, to make it easier and understandable, it is around 1 litre of wine per week.

From the map. We see that the average per capita alcohol consumption varies widely across the world. There is a huge geographical difference: Alcohol consumption across North Africa and the Middle East is particularly low and in many countries, close to zero. The alcohol intake across Europe is highest in Czechia at around 15 litres per person per year. This equals around two bottles of wine per person per week. Countries like Germany, France, Portugal, Ireland, and Belgium are only slightly behind eastern European countries at around 12 to 14 litres

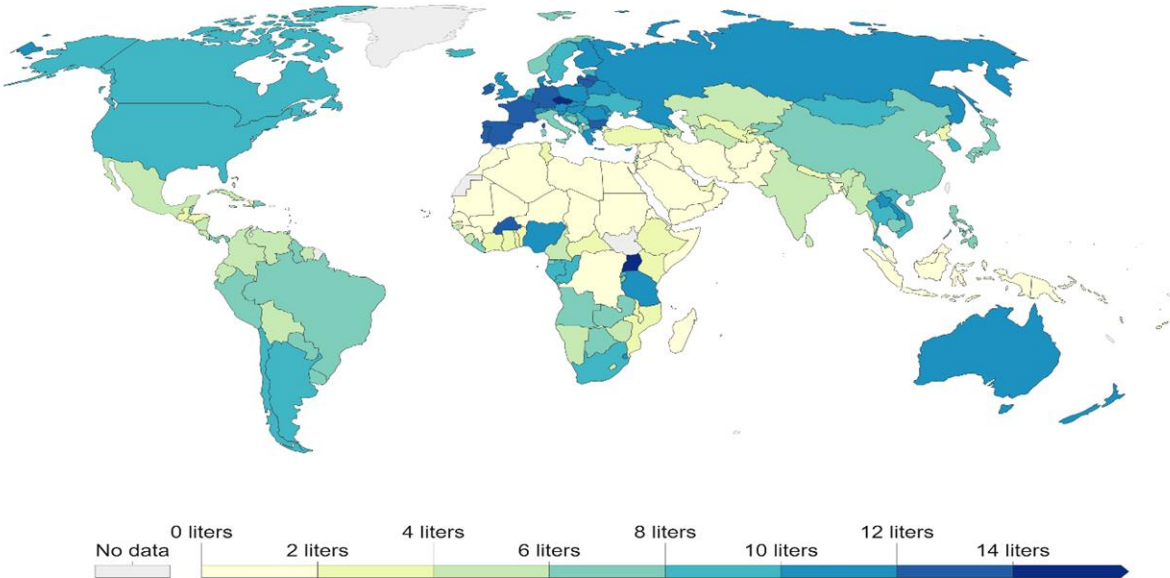
Share of adults who drink alcohol

This interactive map shows the share of adults who drink alcohol. This is given as the share of adults, aged 15 years and older, who have drunk alcohol within the previous year.

In many countries, the majority of adults drink some alcohol. Across Europe, for example, more than two-thirds of population do in most countries.

Alcohol consumption per person, 2018

Consumption of alcohol is measured in liters of pure alcohol per person aged 15 or older.



Source: World Health Organization (via World Bank)

OurWorldInData.org/alcohol-consumption • CC BY

When we look at the global trends on alcohol abstinence, it correlates with the data of prevalence of drinking. We can see particularly high levels of alcohol abstinence across North Africa and the Middle East as mentioned above. In most these countries, there is more than 80 percent of population who have never consumed alcohol.

Alcohol consumption by sex

When we look at gender differences, we can clearly see that in all countries men are likely to consume alcohol more than women are. The difference is much lower in countries where the overall consumption rate is already quite high.



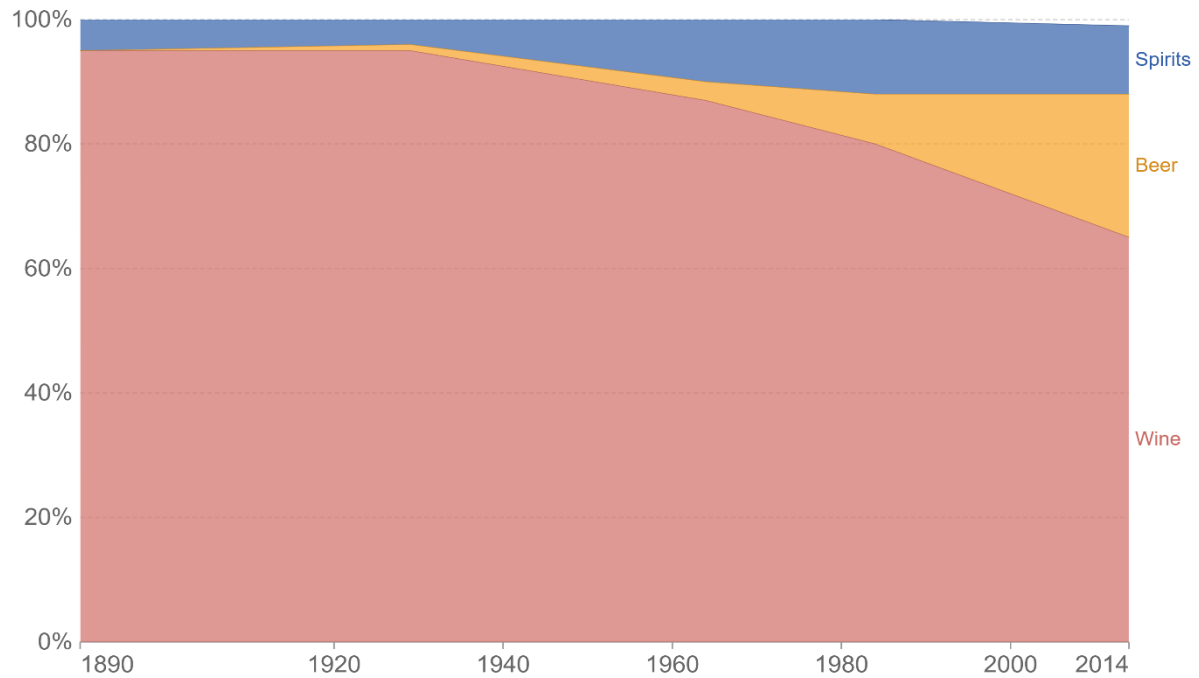
Drinking among women tends to be much lower, where prevalence is low-to-mid range that is less than half of the rate of men.

Alcohol consumption by type of alcoholic beverage in Italy

Here you can see the share of beer consumption increased and now makes up almost a quarter of alcohol consumption in Italy. They are some changes happening in the consumption of different types of alcoholic due to change in culture, custom or trend.

Alcohol consumption by type of alcoholic beverage, Italy, 1890 to 2014

The share of total alcohol consumption from wine, beer and spirits. This is given as the percentage of pure alcohol consumption from each type.



Source: Holmes, A. J., & Anderson, K. (2017). Convergence in national alcohol consumption patterns: New global indicators.

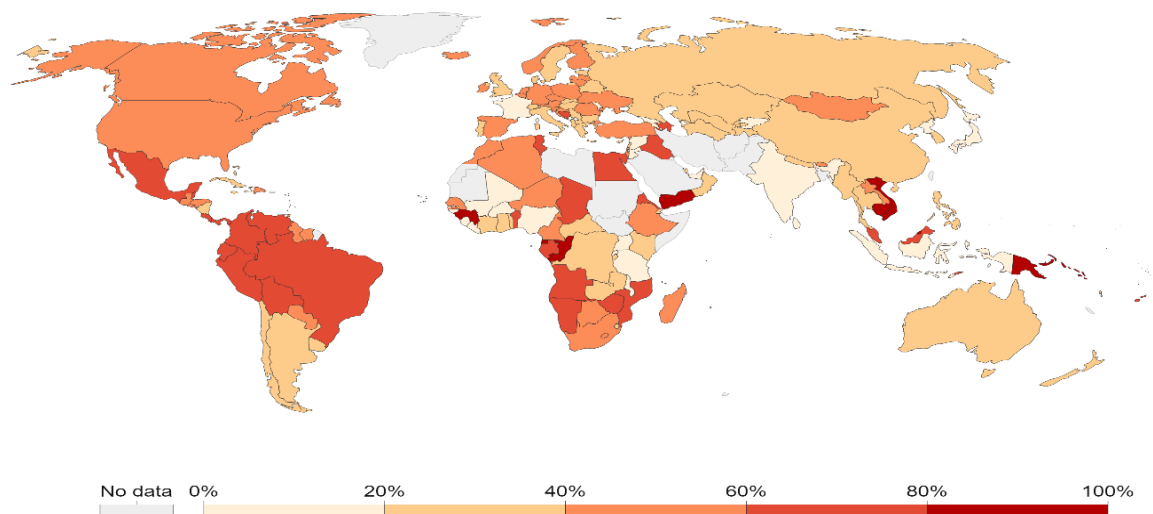
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Global beer consumption

Beer is one of the most easily available and common drink in many countries around the Europe. The chart below here shows global consumption of beer but is not measure in the total quantity, but interims of pure alcohol intake. Beer contains around 5% of pure alcohol per volume so that one litre of beer contains 0.05 litres of pure alcohol.

Beer as a share of total alcohol consumption, 2016

Beer as a share of total alcohol consumption, as measured by the share of total pure alcohol intake.



Source: WHO Global Health Observatory (GHO)

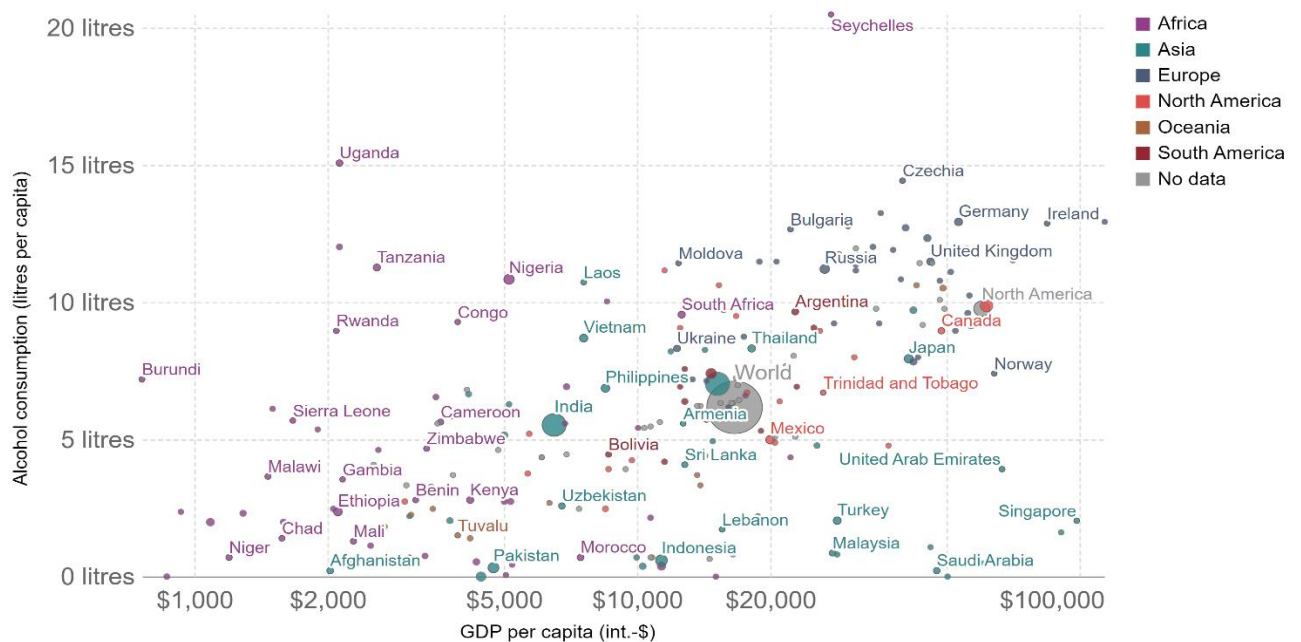
OurWorldInData.org/alcohol-consumption • CC BY

Alcohol consumption vs. income

Does alcohol consumption increase as countries get richer? We can see below the relationship between average per capita and alcohol consumption in litres of pure alcohol consumption per year across countries. When we look at national averages directly, we might not find a unique relationship between income and alcohol consumption. Some countries in Middle East with low alcohol intake but has a high GDP but that is more specifically a strong cultural reason. Interestingly, when we look at consumption data given within countries, we sometimes do see a clear income correlation.

Alcohol consumption vs. GDP per capita, 2018

Average annual alcohol consumption measured in liters of pure alcohol per person aged 15 years or older.



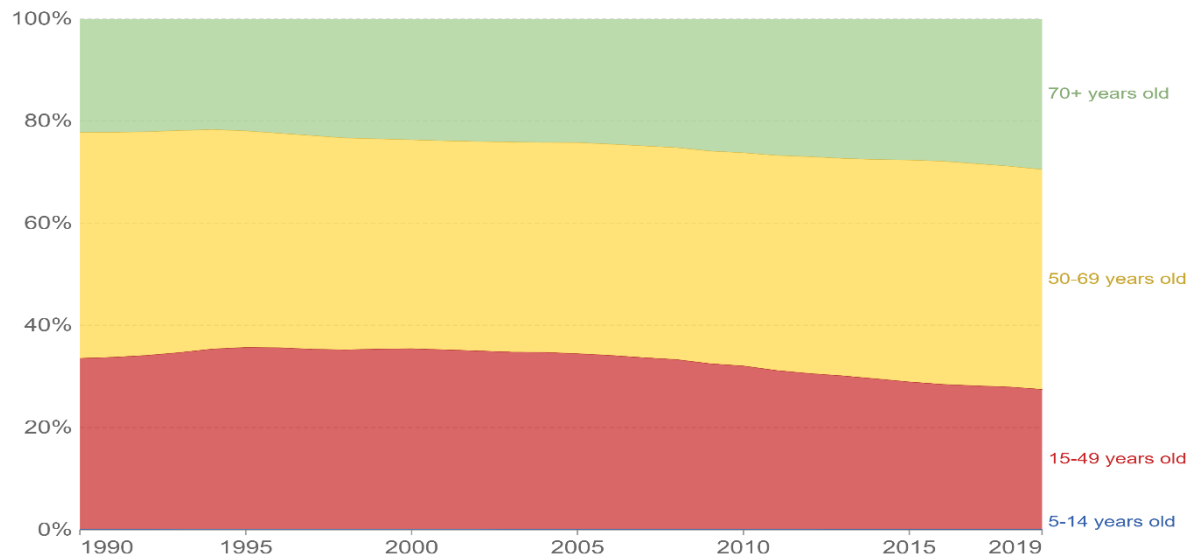
Source: World Health Organization (via World Bank), Data compiled from multiple sources by World Bank
Note: Gross domestic product (GDP) per capita is adjusted for differences in price levels between countries (measured in international-\$).
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The health impact of alcohol

Alcohol is responsible for 2.8 million premature deaths each year. It is one of the world's largest risk factors for premature death. Alcohol consumption is a known as a risk factor for a number of health conditions and potential mortality cases. Alcohol consumption has a causal impact on more than 200 health conditions.

In the chart, we see estimates of the alcohol-attributable fraction (AAF), which is the proportion of deaths that are caused or linked to alcohol (i.e. that a proportion that would disappear if alcohol consumption were removed). The proportion of deaths related to alcohol is between from 2 to 10 percent in most countries.

Premature deaths attributed to alcohol use by age, World, 1990 to 2019



Source: Institute for Health Metrics and Evaluation

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Alcohol related deaths by age

The chart below shows the age distribution of those dying premature deaths due to alcohol. Almost, three quarters are younger than 70 years. 28% are younger than 50 years. The rate has decline globally

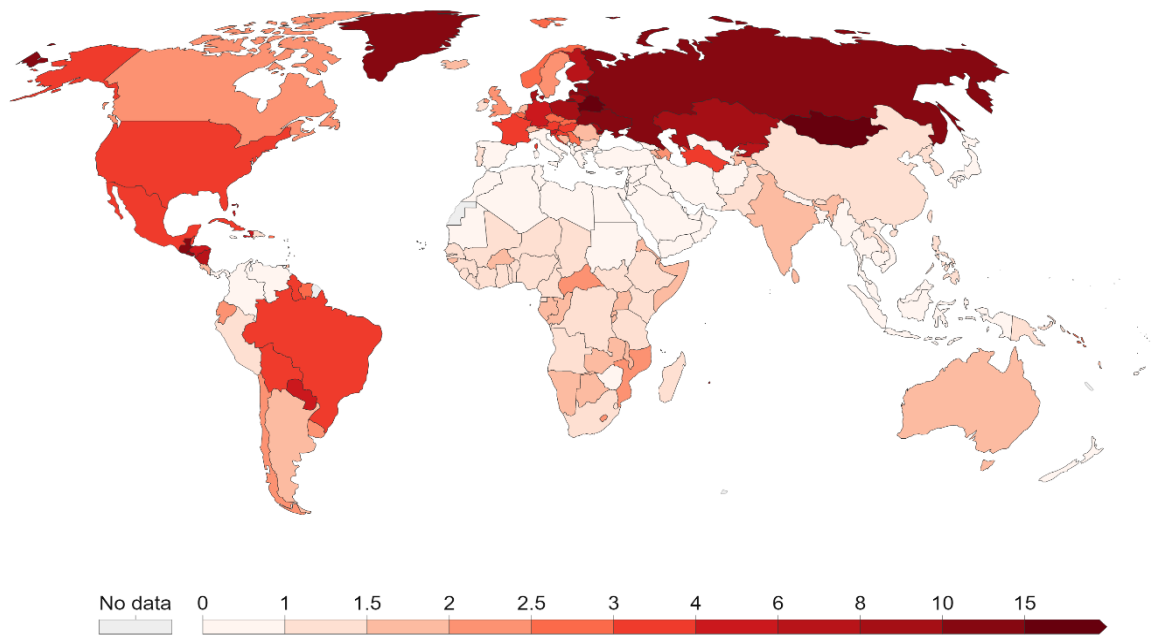
Deaths from alcohol use disorders

Deaths from alcohol dependence can occur both directly or indirectly. Indirect deaths from alcohol use disorders can occur indirectly through suicide. Although clear attribution of suicide deaths is difficult alcohol is known and established risk factor. The estimation of relative risk of suicide in individual with alcohol dependence is almost 10 times higher than non-drinker.

The chart here shows direct death rates (excluding suicide deaths) from alcohol abuse across the world. As per the data of 2019, Belarus had the highest death rate with around 21 people per 100,000 individuals dying from alcoholism. It is estimated that globally, around 168,000 people died directly from alcohol use disorders in 2019. The total estimated number of deaths by country from 1990 to 2019 are shown here.

Death rates from alcohol use disorders, 2019

Age-standardized death rates from alcohol use disorders, measured per 100,000 individuals. Figures do not include indirect suicide deaths which may otherwise be related to alcohol use disorders.



Source: IHME, Global Burden of Disease

OurWorldInData.org/mental-health • CC BY

Alcohol mechanism and metabolism

It is known that Alcohol is eliminated from the body by various metabolic mechanisms. The primary enzymes involved are aldehyde dehydrogenase (ALDH), alcohol dehydrogenase (ADH), cytochrome P450 (CYP2E1), and catalase. It has been also found that the variations in the genes for these enzymes also influence alcohol consumption, dependency and tissue damages. An oxygen deficits in the liver as result of alcohol metabolism where the interaction between alcohol metabolism by-products and other cell components results in the formation of harmful compounds (i.e., adducts) that is highly reactive containing oxygen molecules and cause many other damages.

The effects of alcohol on the tissues depend on its concentration in the blood (blood alcohol concentration [BAC]) over a certain period. BAC is determined by how quickly alcohol is absorbed, distributed, metabolized, and excreted. After an alcohol is orally ingested then it is absorbed mainly from the small intestine into different veins that collects blood from the stomach and bowels and from the portal vein that leads to the liver, where the enzymes metabolized it. The rise of BAC is determined by how quickly alcohol is emptied from the stomach and the extent of metabolism during this first pass through the stomach and liver (i.e., first-pass metabolism **[FPM]**)

BAC is also influence by environmental factors, type of alcoholic beverage and genetic factors and aldehyde dehydrogenase [ALDH2]). The alcohol elimination rate among individuals is influence by factors such as chronic alcohol consumption, diet, age etc.

Even though liver is the main organ responsible for metabolizing the alcohol, stomach (i.e., gastric) ADH has been found also to contribute to FPM. However, the relative contribution of the stomach and the liver to FPM is still controversial. Some previous study mainly contributed FPM to the stomach (Lim et al. 1993; Baraona 2000); some other studies (Lee et al. 2006) stress the role of the liver.

Alcohol also is metabolized in nonliver tissues that do not contain ADH, such as the brain, by the enzymes **cytochrome P450** and **catalase**. In general, both oxidative pathways that either adds oxygen or remove hydrogen through pathway and nonoxidative pathways achieve alcohol metabolism. The nonoxidative pathways metabolism is minimal, but its products may have pathological and diagnostic relevance. One leads to the formation of molecules called fatty acid ethyl esters (FAEEs) and the other pathway results in the formation of a type of fat molecule that contains phosphorus known as phosphatidyl ethanol

Absorption

Alcohol has a two-carbon molecule and it is not commonly consume in its pure form, one can find around 3.2 to 5 percent in beer and then from 12 to 14 percent in wine with certainly much higher percentage in hard drinks.

Alcohol is soluble in both water and fat and because of this, it diffuses easily through all biological membranes. It is absorbed completely from the total gastrointestinal tract but it is mostly absorbed from the upper intestine surface area due to its size. When you drink on an empty stomach then almost 20 percent of single dose is absorbed directly from stomach and remaining 80 percent from the upper intestine. It has been found that woman absorbed more ethanol than men absorb and because of that, they get more impaired leading to more alcohol related organ damages. This seems to result mainly from a lower amount of drug-metabolising enzyme in the wall of stomach in female.

After absorption of alcohol in the body, it is distributed throughout all body fluids and tissues evenly. It immediately crosses the blood brain barrier when it is in the blood and reaches a person brain. It is also important to know that alcohol can easily enter the brain of a developing fetus as it is freely distributed across the placenta. The alcohol level in the developing fetus is same as that of drinking mother.

Metabolism and Excretion

The enzyme named alcohol dehydrogenase enzymatically metabolizes around 95 percent of the alcohol ingested by a person. The remaining 5 percent excreted out of the body unchanged mostly through lungs. We know that 85 percent of the alcohol metabolism occurs in the liver that is the reason why in many alcoholic liver failure is very prone. The remaining 15 percent of alcohol metabolism is carried out by enzyme called **gastric alcohol dehydrogenase** that is located in the inner linings of stomach, which can decrease the blood level of alcohol by 15 percent.

Drinking on empty stomach reduces the time that alcohol is susceptible to first-pass metabolism and will lead to increase blood level. Drinking on a full stomach retains alcohol inside and increases exposure to gastric alcohol dehydrogenase and reduction of the blood level of the drug.

The metabolism of Alcohol happens in three level, **firstly** the alcohol dehydrogenase functions to convert alcohol to **acetaldehyde** that requires co enzyme, **NAD** is needed and its availability helps in the maximum alcohol metabolization. **Secondly**, the **aldehyde dehydrogenase** converts acetaldehyde to acetic acid; the drug disulfiram can inhibit this enzyme. Finally, **acetic acid** is broken down in to CO₂ and water that releases calories.

The effects of Alcohol on Physical level

It has been found out that woman have higher blood ethanol concentration than man because of having a lower level of **gastric alcohol dehydrogenase enzyme**, which metabolizes around 15 percent of alcohol consumed.

Man also has more muscle ratio to fat than woman, have larger vascular compartment, which results in the higher dilution of blood in men, and increase blood alcohol level in woman. Lastly, woman also have higher body fat than man and can concentrate alcohol in plasma, drink for drink, more than man can.

The long-term negative effects of alcohol on one's health is obvious. Liver damage is one of the most common disease that people are aware of disease related to alcoholism.

Long-term consumption of can lead to irreversible changes in the structure and the function of the liver itself. The ethanol produces active oxidant during its metabolism by the **hepatocytes** that puts a heavy stress on liver cells.

It can also lead to nerve destruction during long-term alcohol ingestion, which could lead to permanent brain syndrome with dementia. Even without Korsakoff's syndrome, it could cause cognitive deficit that can be very concerning.

Our digestive system might be also affected like pancreas inflammation and chronic gastritis and development of peptic ulcer can occur too.

Now there are also clear evidence that the chronic alcohol can also be a major risk for **cancer** in humans. Ethanol alone might not be carcinogenic but it can still promote growth of a tumour. As we have known that, the metabolism of ethanol can lead to generation of acetaldehyde, which has been understood to cause tumour growth that can result in oral, stomach and intestine cancer. The risk of head and neck cancer for heavy drinkers, who also smokes is 6 to 15 times greater in people than those who does not indulge in both of them.

The effects of Alcohol on psychoactive level

Alcoholic quite often experience memory problems and some sort of inhibition in their thinking due to over indulgence in it. Many people have problem with memory like recalling sometimes even simple things like people's names. It is clear that long-term consumption of it can certainly cause a brain damage. Alcohol certainly has a profound effect on the complex structures of the brain. It can blocks chemical signals between neurons that leads to the symptoms of intoxication, impulsive behaviour, slurred speech and memory problems and so on. When drinking is continued over a long period, the brain adapts to the blocked signals by responding more dramatically to certain brain chemicals (called neurotransmitters). Even

after alcohol leaves the system, the over activation of these neurotransmitters continues leading to dangerous withdrawal symptoms that can damage brain cells.

This damage is worsen by binge drinking and sudden withdrawal. Its damage to the brain can take several forms. **The first** among it is the neurotoxicity that occurs when neurons over react for too long to neurotransmitters. Over exposure of neurotransmitter can cause neurons to eventually "burn out. Since these neurons are the pathways between different parts of the brain, when they burn out, it can slow down the reactions of these pathways. Apart from the **damage in the pathway**, it can also damage the brain matter itself. Alcoholics have reduced **volume of both grey matter** and white matter over time.

There are some subtle differences in occurrence of brain damages in men and woman but regardless of gender, there is an increase of brain matter loss with increase in age and amount of consumption. Many different types of cognitive impairment can occur because of heavy drinking, like verbal fluency and verbal learning, processing speed, working memory, attention, and so on. Memory and higher function like problems solving and impulse control related parts of the brain are more susceptible to damage than other parts of the brain, so problems in these areas tend to be worse than other parts. Adolescents are at higher at risk for long-lasting or permanent damage and performance deficits as those impacted area are still in process of development. Cognitive impairment grows worse without treatment and develop into an alcohol-related dementia that represents about 10% of all dementia cases

Different countries have mostly similar stringent BAC standard, most state defines 0.08-gram percent as acceptable and above it as an intoxication and a person who drinks above can be charged but that is just a legally established arbitrary value. People whose BAC is lower than 0.08 grams percent can also have an impairment that might be hazardous for driving as individual people can reacts differently to alcohol ingestion. Here below in the table you can see correlation between numbers of drink equivalents imbibed, gender, body mass and resultant blood level alcohol concentration.

Blood Alcohol Concentration – A Guide

One drink equals 1 ounce of 80 proof alcohol; 12-ounce bottle of beer; 2 ounces of 20% wine; 3 ounces of 12% wine.

Men										
Drinks	Approximate blood alcohol percentage (grams%)									
	Body weight (pounds)									
	100	120	140	160	180	200	220	240		
0	.00	.00	.00	.00	.00	.00	.00	.00	.00	Only safe driving limit
1	.04	.03	.03	.02	.02	.02	.02	.02	.02	Impairment begins
2	.08	.06	.05	.05	.04	.04	.03	.03		Driving skills significantly affected
3	.11	.09	.08	.07	.06	.06	.05	.05		
4	.15	.12	.11	.09	.08	.08	.07	.06		Possible criminal penalties
5	.19	.16	.13	.12	.11	.09	.09	.08		
6	.23	.19	.16	.14	.13	.11	.10	.09		Legally intoxicated
7	.26	.22	.19	.16	.15	.13	.12	.11		
8	.30	.25	.21	.19	.17	.15	.14	.13		Criminal penalties
9	.34	.28	.24	.21	.19	.17	.15	.14		
10	.38	.31	.27	.23	.21	.19	.17	.16		

Women											
Drinks	Approximate blood alcohol percentage (grams%)										
	Body weight (pounds)										
	90	100	120	140	160	180	200	220	240		
0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	Only safe driving limit
1	.05	.05	.04	.03	.03	.03	.02	.02	.02	.02	Impairment begins
2	.10	.09	.08	.07	.06	.05	.05	.04	.04		Driving skills significantly affected
3	.15	.14	.11	.10	.09	.08	.07	.06	.06		
4	.20	.18	.15	.13	.11	.10	.09	.08	.08		Criminal penalties
5	.25	.23	.19	.16	.14	.13	.11	.10	.09		
6	.30	.27	.23	.19	.17	.15	.14	.12	.11		Legally intoxicated
7	.35	.32	.27	.23	.20	.18	.16	.14	.13		
8	.40	.36	.30	.26	.23	.20	.18	.17	.15		Criminal penalties
9	.45	.41	.34	.29	.26	.23	.20	.19	.17		
10	.51	.45	.38	.32	.28	.25	.23	.21	.19		

Alcohol is "burned up" by the body at .015 grams% per hour, as follows:
 Number of hours since starting first drink 1 2 3 4 5 6
 Percent alcohol burned up .015 .030 .045 .060 .075 .090

Alcohol is "burned up" by the body at .015 grams% per hour, as follows:
 Number of hours since starting first drink 1 2 3 4 5 6
 Percent alcohol burned up .015 .030 .045 .060 .075 .090

Calculate BAC

Example:
 180 lb. man – 6 drinks in 4 hours
 BAC = .130 grams% on chart
 Subtract .060 grams% burned up in 4 hours.
 BAC equals .070 grams% – DRIVING IMPAIRED.

Calculate BAC

Example:
 140 lb woman – 6 drinks in 4 hours
 BAC = .19 on chart
 Subtract .060 grams% metabolized
 BAC = .13 – LEGALLY INTOXICATED

FIGURE 4.4 Relation between blood alcohol concentration, body weight, and the number of drinks ingested for men and women. See text for details.

Alcohol effects on brain’s neurotransmitter

They are ample of evidence that suggest alcohol can affect brain functions by interacting with different neurotransmitters, which then disrupts the fine balance between the inhibitory and excitatory neurotransmitters. Short-term alcohol consumption can lead to balance in favour of inhibitory and long-term exposure can make the brain interestingly to tilt the balance back towards the equilibrium. When suddenly alcohol consumption is discontinued then these compensatory changes are no longer opposed by the presence of alcohol, which causes the excitation of neurotransmitter systems and alcohol withdrawal syndrome. Long-term alcohol ingestion leads to changes in many neurotransmitter systems that eventually creates craving and desperation.

Each neuron releases one or a few different types of neurotransmitters. Each receptor type responds preferentially to one type of neurotransmitter. However, the subtypes of the same receptor depending on the neurons or its location within the brain will responds differently. Inhibitory neurotransmitters can decrease the response of other neurons to further stimuli, whereas excitatory neurotransmitters will just do the opposite. Some neurotransmitters produce longer lasting changes that impacts process such as learning and memory.

Alcohol Increases Inhibitory Neurotransmission

Gamma-aminobutyric acid (GABA) is the main inhibitory neurotransmitter in the brain that acts through a receptor subtype called GABAA, it leads to a state of sedation and decrease anxiety. Ethanol can activate the GABA –mediated in the ion flows of chloride that results in neuronal inhibition. Sedative medications such as the benzodiazepines (e.g., Valium) also act at the GABAA receptor. They have been also finding that suggests short-term alcohol exposure increases the inhibitory effect of GABAA receptors (Mihic and Harris 1995). However, they are also some research that states alcohol does not increase GABAA receptor function in some brain regions and under certain experimental conditions. Many factors certainly seems to determine whether GABAA receptors respond to short-term alcohol exposure (Mihic and Harris 1995) or not.

Researchers have been focussing on inhibitory neurotransmitters and **Glycine** is the major inhibitory neurotransmitter that is found within the **spinal cord and brain stem**. In the laboratory findings, it has been seen that alcohol increases the function of glycine receptors and alcohol actions on this inhibitory neurotransmission may cause some behavioural effects. Alcohol might also increase inhibitory neurotransmission by increasing the activity of inhibitory neuromodulators, such as **adenosine**. Activation of the adenosine system causes sedation, whereas inhibition of this system causes stimulation. Stimulants that inhibit the actions of adenosine include **caffeine** as well as **theophylline**, a chemical found in tea.

Neurotransmitter systems may interact to produce the sedative effects of alcohol; one primary example is the **Purkinje cells**, a type of neuron found in the cerebellum. In these cells, the increased activation of the GABAA receptor induced by alcohol occurs only with concurrent activation of certain receptors for norepinephrine, a neurotransmitter with many regulatory functions.

Alcohol Inhibits Excitatory Neurotransmission

Alcohol can induce sedative effects by reducing excitation of the neurotransmitters. The major excitatory neurotransmitters in the brain are the **amino acids aspartate and glutamate**, which act through both NMDA receptors and non-NMDA receptor, potentially resulting in sedation. Ethanol can depress the responsiveness of **NMDA receptors** by disrupting **glutamatergic neurotransmitter**. Due to chronic alcohol ingestion and continuous glutamatergic, suppression there is a NMDA receptor compensatory up regulation. Therefore, during the removal of ethanol's inhibitory effect then the excess excitatory receptor would result in withdrawal symptoms like seizure. Unlike, GABAA receptors, these excitatory receptors are relatively insensitive to intoxicating concentrations of alcohol under some experimental conditions. The **drug acamprosate** that is a structural analogue of glutamate is an anticraving drug prescribe to people who have drinking issues.

The genetic of addiction

It is indeed very difficult to establish causal relationships between genetic/genomic variation and the risk of suffering from general or specific complex diseases. They are so many factors that contribute to this: multiple common gene variants with small effects, non-linear genetic variants interactions, phenotype severity, complex networks of gene interactions and similar phenotypes arising from distinct gene variants.

In the case of substance use disorder, a complex role is played by environment factors too. Multidisciplinary evidence claims that the concept of “genetics of addiction” belies the existence of different interwoven layers whereupon genes, developmental processes, and environmental factors interact to increase or decrease the risk for SUD.

Gorwood in his paper reviews the characteristics of genes that are highly relevant to understanding SUD risk, particularly those that influence endophenotypic traits, such as stress reactivity and behavioural disinhibition/impulsivity. They also discuss how the architecture of these genes may affect their chances of undergoing epigenetic modifications, which have emerged as a critical element for understanding how chronic drug exposure is connected to long lasting changes in DA (and other neurotransmitters) signalling and cognitive performance. Individuals with SUD quite often present with a comorbid condition with some other different type of drug or another psychiatric disorder.

It is important to understand that with the exception of genes involved in protection against alcohol or nicotine addictions, via their effects on drug metabolism, the risk of SUDs that can be attributed to other classes of genes is still very small. Nevertheless, findings from genetic/genomic studies have been extremely successful at expanding our understanding of the neurobiology that underlies the drug addiction in helping us to identify new targets for medication development.

Alcohol effects on family, health and social life.

Since ancient time, alcohol has played an interesting role in many human civilizations. It has been said that the foundation of agriculture was not only base on food production but also on desire for the production of beer. In most cultures around the world, drinking is a very important social activity that is loved and shared by many people. People drink for many reasons to celebrate major events like marriage, New Year and then as well everyday events for relaxation and recreational purposes.

Every culture have slightly different attitudes, beliefs, norms and expectancies about drinking and that is reflected in the behaviours of the drinkers. In many western societies, alcohol is associated with problems such as anti-social and violent behaviour where a negative association is made, where as in Mediterranean countries drinking alcohol is considered a peaceful pastime and viewed in a positive light. These countries also tend to exhibit a much lower prevalence of alcohol-related social problems. Of course, alcohol-related problems are associated with excessive drinking in any culture.

Social burden of alcohol consumption

If consumed in excess, alcohol can affect all areas of a person's life, as well as the lives of their family and friends. Personal relationships can be destroyed due to constant arguments and conflicts and of course, many times it could flare up in crime that is more serious. There are also negative consequences in the workplace arising from poor performance and traffic accidents because of alcohol consumption. For some, drinking in excess can lead to legal problems because of anti-social and violent behaviour or the loss of their driving licence.

How can family be affected by alcohol consumption

Drinking can impair a person's overall performance as a parent, a partner as well as how his responsibility to the proper functioning of the household that can have a lasting effects on their partner and children.

Children can suffer Fetal Alcohol Spectrum disorder (FASD), when mothers drink during pregnancy. After birth, parental drinking can lead to child abuse and numerous other impacts that can destroy children's social, psychological and economic environment.

The impact of drinking on family life can include substantial mental health problems for other family members, such as anxiety, fear and depression.

Regularly drinking outside the home mean that person will spend less time at home. The financial cost can weigh heavy on the household income and the family members might have to compromise even on their basic needs. .

Alcohol and domestic violence

Researchers have found that alcohol is responsible in a substantial number of domestic violence accidents. One of the most common pattern is drinking by both the partner and it is shown as a significant risk factor for husband-to-wife violence. Studies have shown that the relationship between alcohol and domestic violence is complex. Drinking frequently has been associated with interfamily violence. A study conducted in Nigeria showed a strong association between domestic violence and alcohol use. Alcohol use was involved in 51% of the cases in which a husband stabbed a wife (Obot, 2000). A cross-sectional study of a random sample of 275 women in Barranquilla, Colombia found that habitual alcohol consumption in the women and in the spouses were factors associated with marital violence (Tuesca & Borda, 2003). Although many studies have found that alcohol use is associated with intimate partner violence, the nature of the association is still not clear.

What is the link between alcohol and poverty?

There is no doubt that the economic consequences of alcohol consumption can be severe, particularly for the poor. Apart from money spent on drinks, heavy drinkers may suffer other economic problems such as lower wages and lost employment opportunities, increased medical expenses and reduction in the ability to afford other basic things. A survey conducted in Sri Lanka showed that for 7% of men exceed their own income compare to money they spend on alcohol. Just for an example, in Cameroon the cost of beer cost a large share of their daily wage.

What are the estimated economic and social costs?

They are efforts made in many countries to estimate the overall economic and social costs of alcohol use. We know that it certainly does have huge **Social and economic costs**. They comprise both direct costs (the value of goods and services delivered to address the harmful effects of alcohol), and indirect costs (the value of personal productive services that are not delivered because of drinking).

In most industrialized countries, estimates of social and economic costs of alcohol use can reach several percent of the Gross Domestic Product (GDP), ranging from 1.1% in Canada to 5-6% in the case of Italy.

Estimating the costs of the impact of alcohol on the material welfare of society is often difficult and requires estimates of the social costs of treatment, prevention, research, law enforcement, lost productivity and some measure of years and quality of life lost.

Health burden of alcohol consumption

Sylvia Matthew Burwell, Secretary U.S. Department of Health and Human Services once said, "The effects of substance use are cumulative and costly for our society, placing burdens on workplaces, the healthcare system, families, states and communities." Alcohol-related incidents account for a significant proportion of overall death and disease. Globally, 3.7% of deaths (2.1 million deaths annually) and 4.4% of the total burden of disease are attributable to alcohol consumption. There is a gender differences; amongst women, 1.6% of the disease burden is attributable to alcohol compared to 4.9% among men.

There is without doubt short-term immediate effects that increase the risk of many harmful health conditions. Most often, the result of binge drinking include the following:

- Injuries from vehicle accident, Violence homicide, suicide and sexual assault
- Alcohol poisoning that is a medical emergency due to high blood alcohol levels.
- Risky sexual behaviours, including unprotected sex or sex with multiple partners. These behaviours can result in unintended pregnancy and sexually transmitted disease.
- Miscarriage and stillbirth or fetal alcohol spectrum disorders are also common among pregnant women who drinks.

Over time, in the long term, excessive alcohol use can lead to the development of chronic diseases and other serious problems including:

- Can cause high blood pressure, heart disease, stroke, liver disease, and digestive problems.
- Breast cancer, mouth, throat, oesophagus, liver, colon, and rectum.
- General weakening of the immune system, increasing the chances of getting sick.
- Learning and memory problems like dementia.
- Depression and anxiety.
- Alcohol use disorders, or alcohol dependence.⁵

By not drinking too much, you can reduce the risk of these short- and long-term health risks.

Treatments of Alcohol addiction

Alcohol-related problem, which result from drinking too much or too often are among the most significant public health issues in many part of the world and particularly in the United States. Many people struggle trying to gain some control over drinking at some point in their lives. More than 14 million adults ages 18 and older have alcohol use disorder (AUD), and 1 in 10 children live in household, where there is an alcohol abuse. Only quite recently, alcoholism was recognise as a multifaceted disease and behavioural process.

In late 1950, American medical association recognise the syndrome of alcoholism as an illness and by mid-1970, it was redefines as a chronic and potentially a fatal disease. Alcoholism as mentioned above is a chronic disease with genetic, psychosocial, and environmental factors that influences it's over all manifestation.

There is some sort of a denial that decreases the awareness of that fact the alcohol use is the cause of person's problems rather than a solution. Moreover, that denial is always one of the major hurdle in the recovery. According to the model presented by **Feldman and colleagues**, the behavioural model of alcoholism include:

- . Alcohol consumption ranges from complete abstention to levels that induces chronic intoxication. In addition, individual can always move up and down the level.
- . The alcohol ingestion results in behavioural reinforcement.
- . Alcohol drinking is also subjected to same control mechanism that also governs other reinforced behaviour.
- . Alcohol is a maladaptive behaviour pattern that is also learned.
- . This behaviour can be altered by suitable reinforcement contingencies that can allow a possibility of control drinking in former alcoholics.

Irrespective of genetic, behavioural, or medical cause of alcoholism, it is clear that the age of onset drinking behaviour affects long-term outcomes and societal functioning. Someone, who started drinking at a young age, will most probably have the poorest outcomes. In many cases, alcohol is first consumed as a self-medication of psychological distress. In addition, person who have anxiety, depression or bipolar or other psychological problems can have their problems alleviated by ethanol. There is also some good evidence that many alcoholics do not have primary alcoholism and it is associated with other psychopathology that includes addiction to other drugs and psychological disorder.

Pharmacotherapies for Alcohol abuse and dependence

Since alcoholism involves an ingestion of alcohol, so its elimination is an obvious therapeutic strategy. It is consider very difficult to have complete successful results.

- . **What** are ideal goal of pharmacotherapy for alcohol dependency and abuse?

- . Reversal of the acute pharmacologic effects of alcohol
- . Treatments and prevention of withdrawal symptoms and complication
- . Maintenance of abstinence and prevention of relapse with agent that can decrease the craving for alcohol or loss of control over drinking
- . Treatments of coexisting psychiatric disorders that complicates recovery.

It should be clear that until now there is no agent that can reverse the acute pharmacologic effects of alcohol completely. Some says that caffeine can antagonise alcohol intoxication and increases alertness but this not true, as behavioural stimulant can only increase activity and cannot reverse the motor, cognitive or dysfunction caused by alcohol.

Pharmacotherapies are treatment and prevent withdrawal symptoms, to reduce relapses of drinking behaviours, and to treat complications in alcohol dependent people that reduces or discontinue alcohol ingestion. Medication can also effectively prevent and treat symptoms like seizures and other complication associated with withdrawal. They are available medication like **anxiolytic**, **anti-depressants** and **mood stabilizer** to address and treat comorbidities observed in alcoholic. The reduction rates of relapse to renewed drinking still remains one of the most difficult problems by use of pharmacologic agents.

Pharmacotherapies for management of Alcohol withdrawal

One of the major goal of withdrawal or detoxification of therapy of managing acute alcohol's primary goal is to control excitement by either reducing glutamate or increase GABA activity.

Usually taking alcohol reduces glutamate activity and increase GABA activity in the brain but during withdrawal, it just turn the opposite. These sudden changes can damage cognitive functioning due to uncontrolled excitation.

Benzodiazepines

It is one of the current drug of choice to treat alcohol withdrawal because it increases GABA activity as the underlying impact. It prevents the seizure from the withdrawal. One might think that it does not make much sense to substitute one addictive drug with another. The reason for this way of treatment is very simple, due to the narrow range of safety and short duration of action of alcohol, it makes it very dangerous to have withdrawal problem from alcohol.

Withdrawal symptom can occurs very fast when alcohol ingestion is stopped. When that is substituted by long-acting drug then it can prevent or suppress the withdrawal symptom.

So benzodiazepine that is the longer-acting drug is either maintained at low level so that the person can function at normal level. Now, at this moment, it is one of the most important drug recommended as the first-line therapy and drugs like **beta-blockers**, **clonidine** and **antipsychotic** drug as an **adjunctive therapy** for the withdrawal problems from alcohol.

Despite some side effects, the drugs like beta-blockers and clonidine are drugs that blocks the functioning of the sympathetic nervous systems as they can ameliorate certain autonomic signs and withdrawal symptoms.

Pharmacotherapies to help maintain Abstinence and Prevent Relapse

They are numerous drugs that are helpful in reducing the daily consumption of ethanol and prevent clinical relapse of alcohol consumption.

Alcohol sensitizing drugs

Drugs like **disulfiram** and **calcium carbimide** are used to help alcoholic to prevent them from drinking because it can produce reaction that can deter the person from drinking. If someone drinks alcohol within several days of taking the aversive drugs then it can result in acetaldehyde syndrome that causes flushing, nausea and vomiting. It is usually believe that **calcium carbimide** has fewer side effects than disulfiram. Daily taking of the aversive drug can also results in total abstinence in many patients. It must be also mentioned that control trial of disulfiram have not been that satisfactory as it does not prove to fare that much better than the placebo treatment.

Opioid antagonist

FDA approved this as a treatment of alcohol dependency and carving in year 1994 despite it has a minor effect. The general hypothesis behind this is that the reinforcing properties of alcohol involve **opioid system** and its blockade by **naltrexone** can reduce the craving by reducing the positive reinforcement associated with alcohol use.

Acamprosate

Another promising drug that is approved in many European countries and is the third drug to be approved by FDA is Acamprosate. It is designed to help in the complete abstinence from ethanol dependency. It has a chemical structure similar to GABA and believe to exert both a GABA-agonistic action at GABA receptors and an inhibitory action at glutamatergic NMDA receptors that is similar to what is exerted by the ethanol. Then they are drugs like dopaminergic such as **bupropion** to maintain abstinence and serotonergic drugs that have well studied to treat alcohol dependency.

Pharmacotherapies to help treat Comorbid psychological conditions

Alcohol relapse is a common phenomenon and its untreated comorbidities are closely linked together. Many of the addictive behaviours and cravings and psychological conditions like anger, anxiety and insomnia involves complex interaction among opioid, serotonergic and dopaminergic systems that are still not perfectly understood.

When alcohol has strong comorbidity with other substance abuse then the psychological and behavioural therapies are essential. Pharmacological treatments alone are never enough without the addition of intense psychological therapies. It can help in providing assistance in the treatment of craving and in the control of emotional states like anger, insomnia and

emotional outburst. They are other different forms of psychological and behavioural therapy that can help or assist in the treatment of alcohol dependency. Nowadays even alternative things like yoga and meditation are also used in combination with other forms of therapy by some counsellor.

Cognitive Behavioural Therapy for Alcoholism

One of the most popular psychotherapy approaches to treat substance abuse is Cognitive behaviour therapy (CBT). It is widely considered the preferred psychotherapy treatment modality for alcohol use disorder. CBT is also called talk therapy that combines therapeutic techniques from both aspects of cognition and behaviour to help individuals becomes aware and try to resolve distorted patterns of thought. The key assumption of the CBT model is that your thoughts, emotions and behaviours are all inter-connected. For example, if you have a low outlook on yourself then you will also tend to feel alone and depressed that can lead you to drink alcohol to numb your internal pain.

Psychoanalyst Aaron Beck first discovered it in 1960, when he detected a pattern of cognitive distortions amongst his patients with depression. He saw in many of his patients patterns of irrational and exaggerated thoughts that he attributed to cognitive deficiencies. With his findings, Beck stopped considering depression as a mood disorder but rather as a cognitive disorder. His research then led to the development of cognitive theory that is now known as CBT.

The CBT Model

The model is used to understand a person problematic behaviour. The core principles of the CBT model are centred on a person's cognitions, or beliefs about themselves, the world, and those around them. The three levels of cognition in the CBT model are:

- . **Core beliefs or schemas:** Core beliefs are underlying beliefs, or schemas, that a person holds about oneself, others, and the world that is influenced by early childhood experiences.

- . **Cognitive distortions or dysfunctional beliefs:** Cognitive distortions are defined as the irrational misbeliefs that people maintain

- . **Automatic thoughts called negative automatic thoughts (NATs):** Automatic thoughts, specifically negative automatic thoughts, are those that are brought on in certain situations without any specific intention. These thoughts intensify problematic behaviour. For instance, if you have an AUD, negative automatic thoughts may cause you to underestimate your ability to cope with a difficult situation and likely drive you to engage in drinking. Therefore, during CBT for addiction, your therapist helps you classify your problems into basic categories, such as

Situations, Actions, Emotions Physical feelings and Thoughts.

These categories can directly affect each other. In other words, our thoughts and feelings about a specific experience may influence how we emotionally interpret it and responds. During behavioural therapy, you and your therapist will be able to identify and reconstruct unhealthy patterns in these areas.

Dialectical Behavioural Therapy (DBT)

It is another type of evidence-based talk therapy that is based on the assumptions that everything is inter-connected. The world constantly changes, and opposite elements (thesis and antithesis) may synthesize into a greater truth and that assumptions is the basis of it.

In practice, an individual or group DBT session will involve learning to live in the present instead of dwelling on the past, managing emotions and distress, and practicing honest communication. Ultimately, DBT is designed to help patients in finding the emotional stability or balance and embrace the positive changes. DBT has four main strategies that are taught by the clinician to the client. Core mindfulness, distress tolerance, interpersonal effectiveness and emotional regulation.

Motivational Interviewing

Motivational interviewing (MI) is a method for encouraging a patient to overcome ambivalence, set direct goals for self-improvement, and stay motivated to realize them. It is a popular technique for treating substance abuse disorders because many people feel powerless and they can benefit from an infusion of willpower in deciding to take action against the addiction. In this treatment, a therapist will encourage a patient to commit to change, such as quitting alcohol. Motivational interviewing is a brief, client-centered, where the full concentration is on improving and strengthening a client's motivation to embrace change. It can strengthen client's perspective on the importance of change that is why it is used among people, who are not strongly motivated or ready for change. It is a supportive and empathetic counselling style and can deal well with resistance from patient. It is a brief intervention of 1 to 4 average sessions and it incorporates **four** basic therapies.

. Expressing empathy, rolling with resistance, developing self-efficacy and developing discrepancy. MI is usually implemented with other therapy modalities.

Conclusion

Dealing with any forms of addiction is not at all a simple and easy thing. They are still lots of room for further research and development of better and more effective drugs that can help people, who are struggling with alcohol dependency. It is important to realize and come to terms when you have an addiction problem. It is possible that one can overcome addiction and repair damaged relationships, mend fences and bury hatchets.

The DSM 5 also recognizes not all people are automatically or equally vulnerable to developing substance-related disorder. Some people have lower levels of self-control that predispose them to develop problems if they are exposed to drugs.

It is important to look into the deeper underlying problems of addiction than just focusing alone on the addiction itself or the substance. They are certainly deeper reason whether it is psychological or genetically or environmental that needs to be understood properly in the right and scientifically meaningful way.

When substance use disorders is not treated then it can be harmful to one's health, relationships, and life as a whole. They can even be fatal, so one should take help as early as possible. The DSM-5 has guidelines for clinicians to determine the severity of the substance use disorder depending on the number of symptoms. Two or three symptoms can indicate a mild substance use disorder; four or five symptoms indicate a moderate disorder, and six or more symptoms indicate a severe substance use disorder. Doctors determine the severity of the level of the substance use disorder to develop the best treatment plan. For higher severity, the more intensive level of treatment. Most patients are likely to need ongoing treatment and recovery support using a chronic care model for several years that should be monitor by a doctor and with an adjustable plan.

Nevertheless, despite being a huge challenge to the individual person and to the society in general in many different ways, they are still many studies underway and certainly, we can hope for more advance and effective drugs in the near future or we can come up with better therapies, as we understand more about the addiction in all aspects.

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