How we perceive the world is all in the mind and therefore life is what we make it. However, we need to be liberated from the restrictions of mundane existence; thus we dream, signifying that we are predisposed to an altered state of consciousness. People seek altered consciousness in a variety of ways such as prayer or meditation; others may pursue such state of mind through art, music, sexual passion or intoxicating substances.

Since prehistory, humans have experimented with naturally occurring substances for their psychoactive effects. Some anthropologists go so far as to claim that psychoactive substances shaped civilizations. Take for example Stone Age art. There has been speculation about the use of hallucinogenic plants and opium by Stone Age cavemen while painting the cave walls and ceilings, mainly of wild animals and hunting scenes.

Intoxicants or psychoactive substances have been used in religious ceremonies; for medicinal purposes and for recreation.

What are these intoxicating substances? There are four groups: hallucinogens (substances causing visual, auditory, and other hallucinations); inebriants (substances like alcohol, chloroform, ether, benzene, and other solvents and volatile chemicals); hypnotics (substances causing states of sleep, stupor or calm, such as the mandrake, kava, tranquilizers and narcotics, including opium and its derivatives); stimulants (substances causing an increase in mental and/or physical stimulation not usually impairing the user’s performance of daily tasks: tea, coffee, cocoa, cola, qat, betel, tobacco, cocaine and amphetamines.

Tea and coffee are mild stimulants. In some cases, the effect of a particular intoxicant overlaps the four groups. A substance classified as a stimulant may, at

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**How to cite this article:** Hajar R. Intoxicants in society. Heart Views 2016;17:42-8.
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the end of the altered state of consciousness it induces, cause sleep, whilst a solvent such as glue, classified as an inebriant, may have hallucinogenic properties.

“ENCHANTING PLANTS”

Users sometimes refer to psychoactive drugs as “enchanting plants,” “disorientation plants,” and “visionary plants.” Patterns of use vary according to epochs and places, depending on how much a society accept the use of that drug.

Nature’s addictive plants are: cannabis, coca, and poppy.

1.1 Opium

The Sumerians in 3400 BC cultivated the opium poppy and referred to it as Hul Gil, the “joy plant.” It was passed on to the Assyrians who in turn passed it on to the Egyptians. The Ebers papyrus (c. 1500 BC), one of mankind’s oldest medical documents, describes a remedy to prevent excessive crying in children using grains of the poppy plant, strained to a pulp, passed through a sieve, and administered on 4 successive days.

Opium Poppy plant

Opium was known to ancient Greek and Roman physicians as a powerful pain reliever. In the English translation of Homer’s Odyssey by Robert Fagles, it is mentioned that Helen used a psychoactive drug on Menelaus’ men but the name of the drug was not mentioned:

“Then Helen, Zeus’ daughter, thought of something else.
She quickly dropped into the wine they were enjoying

a drug which eased men’s pains and irritations, making them forget their troubles. A drink of this, once mixed in with wine, would guarantee no man would let a tear fall on his cheek for one whole day, not even if his mother and his father died, or if, in his own presence, men armed with swords hacked down his brother or his son, as he looked on.

Bk IV:220-289, Odyssey, Homer
(Trans by Robert Fagles)

Translators of the original Greek say that the drug that was mentioned was Nepenthe, which figuratively means “that which chases away sorrow”; (ne = not, and penthos = grief, sorrow, or mourning). So, literally, it means “not-sorrow” or “anti-sorrow”. In today’s world, Nepenthes would be an anxiolytic or an antidepressant. It is thought that this substance was prepared from opium.

It is believed that nepenthes maybe similar to laudanum, an opium tincture attributed to Paracelsus in the 16th century. In the 19th century, laudanum was extensively used in adults and children, for numerous indications such as insomnia, cardiac and infectious diseases. Laudanum was not taxed and hence, cheaper than gin or wine, and so the working class largely consumed laudanum. In the early 20th century, encyclopedias in Western countries still stated that persons in good mental and physical health could use opium without risk of dependence. Opium was also used to treat melancholia.

By the 15th century, the trading and production of opium spread from the Mediterranean to China. Opium has many derivatives, including morphine, codeine, oxycodone, and heroin. Physicians use such drugs as pain medication.
Unfortunately, many patients abuse such medicines. Many countries began to grow and process opium to expand its availability and to decrease its cost. Its cultivation spread along the Silk Road, from the Mediterranean through Asia and finally to China where it was the catalyst for the Opium Wars of the mid-1800s. Opium dens were established as sites to buy and sell opium. Dens were commonly found in China, Southeast Asia, the United States, and parts of Europe. Chinese immigrants to the United States in the mid-1800s worked for railroads and brought the habit of opium smoking with them. Opium dens sprang up in San Francisco’s Chinatown and spread eastward to New York.

### 1.2 Coca

Coca (Erythroxylon coca) has been used as a medicine and stimulant for over 4000 years. It is grown in the Andes mountains of South America – in Colombia, Peru, and Bolivia. Cocaine is extracted from its leaves and inhabitants in South America would chew the leaves as they believed it to elevate mood, help with digestions, and suppress appetite.

Nearly 100 years ago, cocaine was touted as a wonder drug – a cure for everything from morphine addiction to tuberculosis to depression to dyspepsia. To meet the demand, American drug companies began to explore South America for new medicines.

Cocaine has an anesthetic effect and Western medicine used it as such especially in nasal surgery. Cocaine still has limited use in medicine today as a local anesthetic. It is still occasionally used in medical procedures as a topical anesthetic for skin lacerations, nose or throat surgeries, and dental procedures.

Incidentally, at one time there was cocaine in Coca-cola (late 1800s). At that time it was common to use cocaine in patent medicines. Coca-cola drastically reduced its cocaine content to a “mere trace” when it became known that cocaine could be harmful. It was not until 1929 that Coca-Cola drink became cocaine free.

In the 1970s, cocaine evolved as a recreational drug but it was expensive and widely believed to have no serious consequences. It was perceived as a “safe drug.” The price dropped steadily, and by the mid-1980s, it was used on a regular basis, especially by the Americans. The realization that cocaine was highly addictive and dangerous was slow and brought home by the high-profile deaths of celebrities.

Cocaine is processed as powder and crack; crack is considered the more dangerous form of cocaine. Powder cocaine is the hydrochloride salt form (cocaine HCL). As a salt, it is soluble in water, stable as a powder, and usually snorted through the nose and absorbed through nasal mucosa membranes. It can also be dissolved in water or melted and injected. Crack on the other hand is powder cocaine that has been processed with a base, such as baking soda, to remove the HCL, hence, has a slightly modified chemical structure, which allows it to reach the brain more quickly, producing a more intense “high” and thus allowing crack to have greater potential for addiction. The name “crack” is derived from the cracking sound this form of cocaine makes when burned.
Alcohol, nicotine, and caffeine are stimulants and have permeated our culture. They are integral for social interaction and studies claiming health benefits have proliferated. The use of these commodities is a way to escape the drudgery of everyday life.

Each culture has methods to deal with the harshness of reality. Among the Sufis, a Muslim sect, hashish (cannabis or marijuana) was eaten or smoked to reach a state of euphoria. Hashish (sometimes called “wine of Haydar”) was known to the Arabs long before its alleged discovery in mid-12th century by the ascetic monk, Haydar, founder of the religious order of the Sufis.

There are many myths and legends in Arab literature about the use of hashish. Hashish figures in the famous A Thousand and One Nights. One of the stories Scheherazade amused the Sultan with was called “The Tale of the Hashish Eater”. In it she recounted the story of a hashish user who had been reduced to poverty as a result of wasting his savings on this drug and on women. Yet by means of his cherished drug, he was able to escape into a dream world where he was no longer a beggar but a handsome and prosperous lover. One day this pauper took some hashish in a public bath and dropped off into a dream in which he was transported into an enchanting room filled with beautiful flowers and the smell of exotic perfumes. All this time, however, he sensed that this was only a dream and that it would not be long before his presence in the public bath would be noticed and he would be beaten and thrown out. Even so, he continued to enjoy the dream. As he fell deeper into his reverie, he saw himself being carried to another luxurious room filled with soft, plush cushions where he was sexually aroused by a sensuous slave girl. Just as he was about to embrace the girl, he was awakened from his dream by the laughter of the patrons in the bath who had become highly amused at the sight of this beggar under the influence of hashish. And just as he foresaw, he was beaten and evicted from the premises.

Those who read the above story can appreciate the state of “double consciousness” the beggar found himself in as a result of taking hashish – the hashish user hallucinates, but he is also aware that he is hallucinating – he does not lose complete touch with reality. Hashish causes him to dream, but it enables him to remain conscious of his dream so that he can appreciate the images and themes his mind is producing. It was this aspect of hashish use that so fascinated and intrigued Western authors in the latter part of the 19th century. Later on, hashish came to be identified with a group of brigands called “assassins” and hashish gained for itself a reputation as a drug that sowed confusion and chaos.

1.3a Medical marijuana

Medical marijuana or medical cannabis refers to the use of cannabis and its cannabinoids to treat disease or improve symptoms.

Debate has swirled around legalizing marijuana, especially using marijuana in medicine. In June 2015, JAMA published an article on medical marijuana for the treatment of chronic pain and reviewing the pharmacology, indications, and laws related to medical marijuana use. It recommended that physicians should understand both the scientific rationale and the practical implications of medical marijuana laws since they are required to issue certification if a patient needs marijuana.

The use of marijuana and cannabinoids is now common in clinical practice. The JAMA article stated that marijuana has many potential medical benefits, it also has significant health risks. Many studies on marijuana are poor quality; however, marijuana use to control nausea and vomiting related to chemotherapy, chronic pain, neuropathic pain, spasticity associated with multiple sclerosis are supported by high quality research. If indicated, the physician certifies that the
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patient can take marijuana to control his symptoms. Needless to say, there were editorials accompanying the article, calling for better quality research on the topic and concern that medical marijuana is merely a veiled step toward allowing access to recreational marijuana. The potential harm in the chronic use of marijuana such as addiction and psychosis are highlighted. The editorial cautioned that since medical marijuana is not a life-saving intervention, it may be prudent to wait for high-quality evidence before widely adopting its use.

In the USA, medical marijuana laws differ widely from state to state. As of March 2015, 23 states and the District of Columbia had medical marijuana laws in place. Marijuana is not approved by the US Food and Drug Administration (FDA) to treat any medical condition. The American Medical Association (AMA), the Minnesota Medical Association, the American Society of Addiction Medicine, and other medical organizations have issued statements opposing its use for medicinal purposes. But scientific study of the medical uses of marijuana is ongoing. So far, evidence suggests that marijuana may be an effective treatment for chronic pain, neuropathic (nerve) pain, and muscle spasms due to multiple sclerosis or paraplegia. In most US states with medical marijuana laws, marijuana can be used to treat severe or chronic pain and severe or persistent muscle spasms. Some states allow marijuana to be used to treat other conditions, such as glaucoma, seizures, and posttraumatic stress disorder. Every state in the USA with medical marijuana laws has its own list of approved conditions.

In the Netherlands marijuana is illegal but the police do not arrest or prosecute anyone in possession of less than five grams of marijuana for personal use, hence the proliferation of coffee shops where adults could smoke “pot” or marijuana freely. Recently however, the government started to crack down. Australia has decriminalized marijuana and Spain and Canada have legalized it. Barcelona, Spain is developing a reputation as “the new Amsterdam”.

1.4 Fly-agaric or Amanita muscaria mushroom

Priests or shamans have consumed plants for millennia to induce states of trance. The shamans were guardians of the traditions of their culture, and their knowledge of myths, songs, medicines and religious rites was extensive.

The mushroom *Amanita muscaria*, commonly known as fly-agaric, has been at the center of religious rituals in Siberia and Central Asia for at least 3000 years. The fly-agaric is a hallucinogen. The Siberian shaman performed religious rituals usually under the influence of fly-agaric (“mushroom intoxication”). The first known account of the phenomenon is found in a journal written in 1658 by a Polish prisoner of war, who describes its use among the peoples of Western Siberia. The myths of many Siberian peoples contain fly-agaric themes. In many Siberian languages, words meaning “ecstasy”, “intoxication” and “drunkenness” are traceable to words meaning fly-agaric. Siberian cliff drawings depicting armless, one-legged figures bear a remarkable resemblance to the descriptions of figures by men under the influence of *Amanita Muscaria*.

The Fly-agaric had a central and revered role in shamanic practices. It was an ingredient of Soma, a sacred beverage in ancient India, and of Haoma, also a sacred beverage in the religion of ancient Persia (Zoroastrianism, one of the world’s oldest religions).

Among the cultures and societies that used it, the consumption was restricted to sacred occasions. It was abused on peril of death. It was believed that consumption of the fly-agaric by those who were not shamans could be fatal.

Consumption of hallucinogenic mushrooms continues to be popular today in some settings. Motives for their use include simple experimentation; a desire to enhance routine experiences, emotions, or social interactions; to disconnect from reality; to induce visions; as a psychotherapeutic tool; or for mystical or spiritual reasons.

It was not until the 1950s that the involved species of fungi were identified and the chemical nature...
of the active substances was determined. The psychoactive ingredient is attributed to ibotenic acid and muscimol (isoxasoles) or psilocybin, which is similar in chemical structure to lysergic acid diethylamide (LSD). Since both are structural analogues of serotonin (5-hydroxytryptamine), the hallucinogenic effects are probably mediated through effects on serotonergic receptors. Some Siberian tribes report that three (3) fresh A. muscaria mushrooms can be lethal, whereas others claim that eating as many as twenty-one (21) of these mushrooms is safe.

Various hallucinogenic mushrooms containing ibotenic acid and muscimol or psilocybin are found in the New World. In Central America, psilocybe mushrooms were used for its hallucinogenic properties. As already mentioned, mushrooms of this genus contain the psychoactive compounds psilocin and psilocybin.

Reports of toxicity associated with this group of mushrooms have increased as a consequence of their growing popularity as hallucinogens. Circumstances that could lead to hallucinogenic mushroom toxicity are: Adults and adolescents seeking to achieve a state of intoxication (this is the most common reason for ingesting these mushrooms); Incorrect mushroom identification by a naïve forager; Intentional ingestion by a suicidal person; Unintentional ingestion by a child who found mushrooms growing in yards or outdoor play areas; Foul play, in which an individual is poisoned by someone else; Inadvertent poisoning from dried mushrooms purchased on the Internet or from other sources where the composition of the mushroom is unreliable or where the mushroom might be contaminated with unknown toxic compounds.

Incidentally, mushrooms have been traditionally used as insecticide. In some European countries caps of Amanita muscaria are crumbled up and placed in saucers of milk to attract house flies. The flies drink the milk, which contains toxins (they are soluble in water) and the flies soon become drowsy, collapse and die (or they simply drown in their spiked milk drink). The specific epithet muscaria comes from the Latin word musca, meaning “a fly”.

**ADDITION: A COMPLEX ILLNESS**

A real danger of psychoactive substances is their highly addictive nature. Human beings have always had a desire to eat or drink substances that make them feel relaxed, stimulated, or euphoric. Psychoactive drugs induce such feelings but they can also cause addiction, an illness with far-reaching consequences. Even mild psychoactive substances such as alcohol, nicotine, and caffeine can become compulsive habits.

Abnormal patterns of use of these substances have been observed since antiquity. Alexander the
Great was a heavy drinker. Closer to our times, Adolf Hitler reportedly consumed a cocktail of some 74 substances, including morphine, methamphetamines and barbiturates, according to a 2014 TV documentary. Marilyn Monroe overdosed on barbiturates. Benjamin Franklin abused laudanum (an opiate and alcohol mixture for pain and ailment) but lived to the ripe old age of 84. In those days, laudanum was not a problem. Freud became addicted to cocaine while studying the effects of cocaine and unsuccessfully used it to treat his best friend’s morphine addiction.

In the past, the term “addiction” was not used but rather the condition was referred to as “toxicity” and “inebriety.” Nowadays, addiction in its current medical meaning is a compulsion and need to continue taking a drug as a result of taking it in the past. A common feature of addictive substances is the “dopamine surge” which induces feelings of pleasure and euphoria by activating a mesolimbic dopaminergic reward system in the brain.

Addiction is a “learned” behavior; we actively seek addictive drugs. Our relationship with substances is shaped by multiple factors, including culture, society, religion, and individual psychology. There are social structures that drive people to take addictive substances such as widespread poverty, racism, limited options, and lack of access to education, lack of access to healthcare, lack of access to safe housing and good food. Any or all of those factors would drive anybody to feel desperate. If there is medicine available that makes one feel good, naturally such medicine will be consumed.

But addiction is not merely about the substance abused. The personality of the person abusing the drug matters a lot also. Some people think that legalizing psychoactive drugs will eradicate addiction. Debate on the issue is ongoing. Some believe that legalizing it will make the substance more accessible and that it would increase the number of casual users which, in turn, would increase the number of drug abusers. The War on Drugs, initiated by the USA in the 1970s has not made a difference. (“The War on Drugs” is an American term commonly applied to a campaign of prohibition of drugs, military aid, and military intervention, with the stated aim being to reduce the illegal drug trade.) If anything, the problem of drug addiction has increased. The campaign aims to punish the offender rather than treat the problem.

Addiction is a disease. History has shown that addiction has been around since antiquity. Public education and information and availability of resources about the effects of psychoactive drugs should be our goal. Once people understand the underlying pathology of addiction, people with addiction should not have to feel shame or feel inferior. They should receive the help they need and obtain evidence-based treatments like diabetes, heart disease or cancer. Education about addiction will also help other people understand that addicts are suffering from a disease that should be treated like any other.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

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