International Scientific Journal of Engineering and Management
Volume: 03 Issue: 12 | Dec – 2024
An International Scholarly || Multidisciplinary || Open Access || Indexing in all major Database & Metadata
ISSN: 2583-6129
DOI: 10.55041/ISJEM02177

Obligation and Familiarization Treatment for Drug Addiction- A Review

Dr. J. SAI CHANDRA
Assistant Professor, Dept. of Chemistry, JNTUH University College of Engineering Sultanpur, Sangareddy, Telangana, INDIA- 502273.

ANITHA NALLAMOTHU,
Assistant Professor (c), UCEN-JNTUK Narasaraopet, Andhra pradesh, INDIA- 522 601.

Dr V L N Murthy KAMAVARAPU
Lecturer, Dept. of Chemistry, SVR DEGREE COLLEGE, Macherla, Andhra Pradesh- 522 426

ABSTRACT:

Drug addiction has become a worldwide problem and the leading cause of death. In recent years, India is seeing a rising trend in drug addiction. The most common drug use in India is alcohol, followed by cannabis and opiates. Drug use, whether licit or illicit, causes serious health problems in individuals. The national survey on drug use in India indicated that the prevalence of drug abuse among males in the general population is significant. Economic burdens disturbed family environments, violence, and psychological problems are other, consequences of drug abuse in the family. Adolescent drug abuse is another major area of concern because more than half of the person's with substance use disorder are introduced to drugs before the age of 15- year Drug treatment is intended to help addicted individuals stop compulsive drug seeking and use. Treatment can occur in a variety of settings, take many different forms, and last for different lengths of time. Because drug addiction is typically a chronic disorder characterized by occasional relapses, short-term, one-time treatment is usually not sufficient. For many, treatment is a long-term process that involves multiple interventions and regular monitoring. The current paper highlights the causes of drug abuse and describes the treatment and prevention of drug abuse and addiction to properly manage the problem.

Keywords: Drug Treatment, Economic burdens and Drug abuse.

INTRODUCTION:

Drug and Drug Use [1]: A drug is a substance that can be taken into the human body and, once taken, alters some processes within the body. Drugs can be used to diagnose, prevent or treat a disease. Some drugs are used to kill bacteria and help the body recover from infections. Some drugs assist in terminating headaches. Some drugs cross the blood-brain barrier and affect neurotransmitter function.

Overdoses: Overdosing refers to taking enough of a drug such that functioning is grossly impaired, and even survival may be jeopardized. Regarding drug use action, some doses produce the intended effect for a percentage of drug users (i.e., effective dose) and a dose that will kill the drug user (i.e., lethal dose). Different means of administration, time for distribution, time for action, time for elimination, and context factors may affect the effective-to-lethal dose relation.

Overdosing often refers to reaching a near-fatal dose but not always; it may also mean loss of function such that special care is needed. Drug addiction, as described by WHO (1950) is "a stage of periodic and chronic intoxication detrimental to the individual and society, produced by the repeated consumption of a drug (natural or synthetic)."

Its Characteristics Include:

1. An overwhelming desire, a need (compulsion) to continue taking drugs and to obtain it by any means;

ISSN: 2583-6129
DOI: 10.55041/ISJEM02177

2. A tendency to increase the dose;
3. A psychic (psychological), sometimes physical, dependence on the effects of the drugs.

Drug dependence is the process of chemicals that affect the central nervous system in a way

Terminologies in Drug Abuse [1, 2]:

TABLE 1: TERMINOLOGIES IN DRUG ABUSEexperienced as pleasurable but hazardous to health if taken in immoderate amounts. More importantly, from the clinical point of view, their intoxicating effects may acquire a compulsive allure that it is so powerful as to defy rational control. Drug dependence is a psychological and physiological phenomenon where it becomes extremely difficult or impossible for the drug user to stop the habit. Psychological dependence occurs when a drug is so central to the person's thoughts, emotions, and activities that it is extremely difficult to stop or even think about it. An intense craving marks it for the drug and its effects.

Term	General description	Example
Drug	A substance that can be taken into the body that alters one or more processes within the body	Alcohol, nicotine, cocaine, marijuana, etc
Street drug	Any drug that is misused; that is, any drug that may have dangerous consequences and is considered improper to use either intrinsically or within the social circumstances in which it is used	Alcohol (in underage drinking), heroin, methamphetamine, crack, cocaine, marijuana
Hard drug	A drug that is generally considered to be more dangerous, with a higher risk of dependence than soft drugs	Heroin, methamphetamine, crack/cocaine
Soft drug	A drug whose use supposedly does not result in as severe a degree of dependence as a hard drug and is often considered relatively less dangerous by society, although the negative consequences may be just as or more severe (e.g., lung cancer from tobacco use)	Marijuana, alcohol, nicotine
Illicit drug	An illegal drug; that is, the drug is not a legally prescribed drug/pharmaceutical	Marijuana, cocaine, heroin, LSD
Designer drug	A synthetic drug very similar in chemical makeup to an existing drug and thus exerting similar pharmacological effects as the existing drug	Ecstasy
Club drug	A drug whose use primarily occurs in clubs, bars, and trance parties, such as raves, and usually by adolescents or young adults	Ecstasy, Rohypnol (“roofies”), GHB, ketamine (“special K”), LSD

Biology of Drug-Addiction [5]:

Neurobiology of Reward: Organisms possess adaptive, evolutionarily determined systems that mediate the acquisition of pleasurable rewarding behavior needed for survival, i.e., sex, food, and social affiliation, and avoidance of aversive events. Three brain areas mediate such adaptive behaviour: the nucleus accumbens, which mediates reward- related activities (positive valence); the amygdala, involved in fear-motivated behaviour (negative valence) and the prefrontal cortex, involved in decision-making and prediction of rewarding behaviour by determining salience attribution of environmental stimuli and directing the intensity of the behavioural response. Balanced functioning of motivational and affective states combined with external stimuli that predict reward determine the overall output of a given behavioural response in acquiring natural reward.

What Happens to the Brain when Drugs are taken: Drugs tap into the brain’s communication system and disrupt the normal functioning of the brain cells sending, receiving, and processing information. There are two ways a drug can disrupt normal cell functioning:

1. By imitating the brain neurotransmitters
2. By over-stimulating the “reward circuit” of the brain.

Some drugs, such as marijuana and heroin, have structural similarities to some neurotransmitters naturally produced by the brain and fool the brain receptors and activate the nerve cells to send abnormal messages. Some drugs, such as cocaine and methamphetamines, stimulate the nerve cells to release abnormally large amounts of natural neurotransmitters or prevent the normal recycling of these brain chemicals. It produces greatly amplified messages and disrupts normal communication patterns. Almost all addictive drugs target the brain’s reward system by flooding the circuit with dopamine. These drugs activate the mesolimbic dopamine system, reinforcing pharmacological and natural rewards. The mesolimbic system consists of

ISSN: 2583-6129
DOI: 10.55041/ISJEM02177

dopaminergic neurons in the ventral tegmental area (VTA) and their axonal projections to terminal fields in the nucleus accumbens (NA) and the prefrontal cortex (PFC). Addictive drugs act on this system to increase synaptic levels of dopamine (DA). These drugs have specific receptors in the brain, and an increase in dopamine levels in the mesolimbic system produces their final effect.

Causes of Drug Addiction [3]:

A. Environmental Causes
B. Genetic causes
C. Development causes
D. Traumatic causes
E. Mental Health Causes

(A) Environmental Causes: A person's environment plays a large role in the development of drug addiction. Some people turn to drug use to cope with problems in their real lives. Being around drugs and being exposed to addicts can also lead to drug addiction. If a family member or close friend uses or is addicted to drugs, it seems more acceptable for other members to engage in similar behavior. It becomes a tolerated activity.

(B) **Genetic Causes:** Not everyone who tries a drug will become addicted. Researchers have determined that some people have a genetic predisposition to becoming addicted to drugs. For example, the dopamine D2 receptor A1 gene is more common in alcoholics and cocaine abusers than in the general public. Researchers believe this gene is linked to compulsive or feeling-seeking behavior. However, some people in the general public have this gene without developing an addiction; addiction likely involves more than just. a gene and requires other factors to play a role. Researchers have also found other genes associated with an increased or decreased susceptibility to drug (or alcohol) addiction. CYP2A6 is more common in non-smokers and causes nausea and dizziness after smoking; people who have two copies of the ALDH*2 gene variation are less likely to become alcoholics.

(C) Developmental Causes: Events during development can increase one's risk of becoming addicted. Confused parental environments, childhood experiences, and early drug use can all have an influence. Adolescents are in a very vulnerable position because of their development or lack of it. The earlier drug use begins, the more likely it is to progress to abuse. Drug use changes the way the brain functions and makes it more likely that a person will become addicted; drug use makes it difficult to make clear decisions, control your behavior, and feel OK without the drug. Adolescents also lack the appropriate decision- making skills and are more prone to risk-taking behavior like drug use.

(D) **Traumatic Causes:** Drug use and abuse may also result from traumatic experiences. Sexual assault, a history of abuse, natural disasters, or post-traumatic stress disorder can all trigger drug or alcohol addiction.

(E) Mental Health Causes: Drug addiction can also be caused by using drugs to mask other mental problems. For example, depressed people frequently use drugs to escape their sad feelings. Schizophrenics find that some street drugs can control their hallucinations. In some cases, the drug use itself may lead to mental problems.

Drugs of Abuse [3, 4]:
Alcohol: People drink to socialize, celebrate, and relax. Alcohol often has a strong effect on people; throughout history, people have struggled to understand and manage alcohol's power. Why does alcohol cause people to act and feel differently? How much is too much? Why do some people become addicted while others do not? The National Institute on Alcohol Abuse and Alcoholism is researching the answers to these and many other questions about alcohol. Here's what is known:

- Alcohol's effects vary from person to person, depending on a variety of factors, including:
- How much you drink
- How often you drink
- Your age

ISSN: 2583-6129
DOI: 10.55041/ISJEM02177

- Your health status
- Your family history
- While drinking alcohol is not necessarily a problem, drinking too much can cause a range of consequences, and increase your risk for various problems.

TABLE 2: DRUG OF ABUSE: AYAHUASCA

For more information on alcohol's effects on the body, please see the National Institute on Alcohol Abuse and Alcoholism's (NIAAA's) related web page describing alcohol's effects on the body. NIAAA also has some information about mixing alcohol with certain medicines.

Ayahuasca: A hallucinogenic tea made in the Amazon from a DMT-containing plant (Psychotria viridis) along with another vine (Banisteriopsis caapi) that contains an MAO inhibitor preventing the natural breakdown of DMT in the digestive system, thereby enhancing serotonergic activity. It was used historically in Amazonian religious and healing rituals.

Street Names	Commercial Names	Common Forms	Common Ways Taken	DEA Schedule
Aya, Yagé, Hoasca	No commercial uses	Brewed as tea	Swallowed as tea	DMT is Schedule I, but plants containing it are not controlled
Possible Health Effects				
Short-term	Strong hallucinations including altered visual and auditory perceptions; increased heart rate and blood pressure; nausea; burning sensation in the stomach; tingling sensations and increased skin sensitivity.			
Long-term	Possible changes to the serotoninergic and immune systems, although more research is needed.			
Other Health-related Issues	Unknown.			
In Combination with Alcohol	Unknown.			
Withdrawal Symptoms	Unknown.			
Treatment Options				
Medications	It is not known whether ayahuasca is addictive. There are no FDA-approved medications to treat addiction to ayahuasca or other hallucinogens.			
Behavioral Therapies	More research is needed to find out if ayahuasca is addictive and, if so, whether behavioral therapies are effective.			

Central Nervous System Depressants:

Medications that slow brain activity, which makes them useful for treatinganxiety and sleep problems.

BLE 3: DRUG OF ABUSE: CENTRAL NERVOUS SYSTEM DEPRESSANTS

Street Names	Commercial Names	Common Forms	Common Ways Taken	DEA Schedule
Barbs, Phennies, Red Birds, Reds, Tooies, Yellow Jackets, Yellows	Barbiturates: entobarbital (Nembutal®)	Pill, capsule, liquid	Swallowed, injected	II, III, IV
Candy, Downers, Sleeping Pills, Tranks	Benzodiazepines: alprazolam (Xanax®), chlorodiazepoxide (Librium®), diazepam (Valium®), lorazepam (Ativan®), triazolam (Halicon®)	Pill, capsule, liquid	Swallowed, snorted	IV
Forget-me Pill, Mexican Valium, R2, Roche, Roofies, Roofinol, Rope, Rophies	Sleep Medications: eszopiclone (Lunesta®), zaleplon (Sonata®), zolpidem (Ambien®)	Pill, capsule, liquid	Swallowed, snorted	IV
Possible Health Effects				
Short-term	Drowsiness, slurred speech, poor concentration, confusion, dizziness, problems with movement and memory, lowered blood pressure, slowed breathing.			
Long-term	Unknown.			
Other Health-related Issues	Sleep medications are sometimes used as date rape drugs. Risk of HIV, hepatitis, and other infectious diseases from shared needles.			

ISSN: 2583-6129
DOI: 10.55041/ISJEM02177

In Combination with Alcohol	Further slows the heart rate and breathing, which can lead to death.
Withdrawal Symptoms	Must be discussed with a health care provider; barbiturate withdrawal can cause a serious abstinence syndrome that may even include seizures.
Treatment Options	
Medications	There are no FDA-approved medications to treat addiction to prescription sedatives; lowering the dose over time must be done with the help of a healthcare provider.
Behavioral Therapies	More research is needed to determine if behavioral therapies can be used to treat addiction to prescription sedatives.

MDMA (Ecstasy/Molly): A synthetic, psychoactive drug similar to the stimulant amphetamine and the hallucinogen mescaline. MDMA is an abbreviation of the scientific name 3, 4-methylenedioxy-metham-phetamine.

Treatment for Drug Addiction [4]: There are many options that have been successful in treating drug addiction, including:

1. Therapies.
2. Medication.
3. Medical devices and applications used to treat withdrawal symptoms.

(A) Therapies: Therapies used in addiction treatment are based on an individual's health and substance abuse patterns. Options for therapy include an array of individual or group therapy sessions, which addiction counselors typically organize.

Behavioral Therapies Help Patients:

- Modify their attitudes and behaviors related to drug use
- Increase healthy life skills
- Persist with other forms of treatment, such as medication
- Patients can receive treatment in many different settings with various approaches.

Outpatient Behavioral Treatment: It includes a wide variety of programs for patients who visit a behavioral health counselor on a regular schedule. Most of the programs involve individual or group drug counseling, or both. These programs typically offer forms of behavioral therapy such as:

Cognitive-behavioral therapy helps patients recognize, avoid, and cope with the situations in which they are most likely to use drugs. Multidimensional family therapy developed for adolescents with drug abuse problems as well as their families addresses a range of influences on their drug abuse patterns and is designed to improve overall family functioning through motivational interviewing, which makes the most of people's readiness to change their behavior and enter motivational treatment incentives (contingency management), which uses positive reinforcement to encourage abstinence from drugs

Inpatient or Residential Treatment: It can also be very effective, especially for those with more severe problems (including co-occurring disorders). Licensed residential treatment facilities offer 24- hour structured and intensive care, including safe housing and medical attention. Residential treatment facilities may use various therapeutic approaches, generally aimed at helping the patient live a drug-free, crime-free lifestyle after treatment. Examples of residential treatment settings include:

Therapeutic communities are highly structured programs in which patients remain at a residence, typically for 6 to 12 months. The entire community, including treatment staff and those in recovery, act as key agents of change, influencing the patient's attitudes, understanding, and behaviors associated with drug use. Shorter-term residential treatment typically focuses on detoxification and providing initial intensive counseling and preparation for treatment in a community-based setting. Recovery housing provides supervised, short-term housing for patients, often following other types of inpatient or residential treatment. Recovery housing can help people make the transition to an independent life for example, helping them learn how to manage finances or seek employment, as well as connecting them to support services in the community.

(B) Medication [2, 3, 5]: Medications are available for treatment of opioid (heroin, prescription pain relievers), tobacco (nicotine), and alcohol addiction. Scientists are developing other medications to treat stimulant

ISSN: 2583-6129
DOI: 10.55041/ISJEM02177

(cocaine, methamphetamine) and cannabis (marijuana) addiction. People who use more than one drug, which is very common, need treatment for all of the substances they use. in May 2018, the FDA approved lofexidine, a non-opioid medicine designed to reduce opioid withdrawal symptoms

Opioids: Methadone (Dolophine®, Methadose®), buprenorphine (Suboxone®, Subutex®, Probuphine®, Sublocade™) and naltrexone (Vivitrol®) are used to treat opioid addiction. Acting on the same targets in the brain as heroin and morphine, methadone and buprenorphine suppress withdrawal symptoms and relieve cravings. Naltrexone blocks the effects of opioids at their receptor sites in the brain and should be used only in patients who have already been detoxified. All medications help patients reduce drug-seeking and related criminal behavior and help them become more open to behavioral treatments.

A NIDA study found that once treatment is initiated, both a buprenorphine/ naloxone combination and an extended-release naltrexone formulation are similarly effective in treating opioid addiction. Because full detoxification is necessary for treatment with naloxone, initiating treatment among active users was difficult, but once detoxification was complete, both medications had similar effectiveness.

Tobacco: Nicotine replacement therapies have several forms, including patches, spray, gum, and lozenges. These products are available over the counter. The U.S. Food and Drug Administration (FDA) has approved two prescription medications for nicotine addiction: bupropion (Zyban®) and varenicline (Chantix®). They work differently in the brain, but both help prevent relapse in people trying to quit. The medications are more effective when combined with behavioral treatments, such as group and individual therapy as well as telephone quitlines.

Alcohol: Three medications have been FDA- approved for treating alcohol addiction; a fourth, topiramate, has shown promise in clinical trials (large-scale studies with people). The three approved medications are as follows:

Naltrexone blocks opioid receptors involved in the rewarding effects of drinking and the craving for alcohol. It reduces relapse to heavy drinking and is highly effective in some patients. Genetic differences may affect how well the drug works in certain patients. Acamprosate (Campral®) may reduce long-lasting withdrawal symptoms, such as insomnia, anxiety, restlessness, and dysphoria (generally feeling unwell or unhappy). It may be more effective in patients with severe addiction.

Disulfiram (Antabuse®) interferes with the breakdown of alcohol. Acetaldehyde builds up in the body, leading to unpleasant reactions that include flushing (warmth and redness in the face), nausea, and irregular heartbeat if the patient drinks alcohol. Compliance (taking the drug as prescribed) can be a problem, but it may help patients who are highly motivated to quit drinking

(C) Devices: Devices can help suppress withdrawal symptoms during detoxification. Detoxification is not in itself "treatment" but only the first step in the process. Patients who do not receive any further treatment after detoxification usually resume their drug use. One study of treatment facilities found that medications were used in almost 80 percent of detoxifications (SAMHSA, 2014).

In November 2017, the Food and Drug Administration (FDA) granted a new indication to an electronic stimulation device, NSS-2 Bridge, for use in helping reduce opioid withdrawal symptoms. This device is placed behind the ear and sends electrical pulses to stimulate certain brain nerves.

CONCLUSION: Drug use and addiction cause a lot of diseases and disabilities in the world. Recent advances in neuroscience may help improve policies to reduce the harm that the use of tobacco, alcohol and other psychoactive drugs impose on society.

Effective action should take into account the following:

- Since, the effects of drugs on health vary greatly depending on the type of drug and on the way it is used, the public health response to drug use should be proportional to the health- related harm it causes.

- The use of psychoactive substances is expected because of their pleasurable effects and social influences.

ISSN: 2583-6129
DOI: 10.55041/ISJEM02177

The greater the frequency and amount of drug used, the higher the risk of becoming dependent.

❖ Effective public health policies and programmes that address drug dependence and other forms of harmful drug use could significantly reduce the overall health burden of drug use.

❖ The risk of becoming dependent on drugs is determined by biological, genetic, psychological, social, cultural, and environmental factors. Currently, it is impossible to predict who will become drug dependent.

❖ Drug dependence is a medical disorder, not a lack of willpower or strength of character.

❖ Drug dependence and mental illnesses often affect the same individuals. Therefore, it would be useful to integrate research, assessments, and treatments for both disorders. The cost-effective treatment and management of drug dependence can save lives, improve health, and reduce costs to society. Beyond stopping drug use, effective treatment requires changes in the behaviour of users and often the use of substitute drugs.

❖ Treatment must be accessible to all in need and the health care sector should provide the most cost-effective treatments.

REFERENCES:

1. Moore N, Biour M, Paux G, Loupi E, Begaud B and Boismare F: Adverse drug reaction monitoring: Doing it the French way. Lancet 1985; 2: 1056–8.
2. Gallelli L, Ferreri G, Colosimo M, Pirritano D, Guadagnino L and Pelaia G: Adverse drug reactions to antibiotics observed in two pulmonology divisions of catanzaro, Italy: A six-year retrospective study. Pharmacol Res 2002; 46: 395–400.
3. Johnell K and Klarin I: The relationship between number of drugs and potential drug-drug interactions in the elderly: A study of over 600,000 elderly patients from the Swedish Prescribed Drug Register. Drug Saf 2007; 30: 911–8.
4. Seedher N and Agarwal P: Effect of metal ions on some pharmacologically relevant interactions involving fluoroquinolone antibiotics. Drug Metabol Drug Interact. 2010; 25: 17–24.
5. Rushing DA, Raber SR, Rodvold KA, Piscitelli SC, Plank GS and Tewksbury DA: The effects of cyclosporine on the pharmacokinetics of doxorubicin in patients with small cell lung cancer. Cancer 1994; 74: 834–41.

