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Pharmacist's role in preventing drug abuse: A comprehensive review of illicit use of prescription and over-the-counter drugs for euphoric effects

ZULEKA AMBRIN *, K VINEETHA and A R SHABARAYA

Department of pharmacy practice, Srinivas College of Pharmacy, Mangalore-574143, India.

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Abstract

The illicit use of prescription and over-the-counter drugs to achieve intoxication, commonly referred to as "pharmaceutical highs," has emerged as a significant public health concern in recent years. The article begins by examining the reasons behind the illicit use of prescription and over-the-counter drugs, including the desire for euphoria, relaxation, enhanced cognitive performance, and self-medication for various psychological and physical conditions. It highlights the accessibility and perceived safety of these substances, as well as the influence of social and peer factors, as contributing factors to their misuse.

To provide a comprehensive understanding, the review covers a wide range of prescription medicines such as quetiapine, gabapentinoids, Z-drugs, bupropion, venlafaxine, and over-the-counter medicines such as loperamide, dextromethorphan, benzydamine, promethazine, chlorphenamine, diphenhydramine and hyoscine butylbromide,codeine that have emerged as misused and diverted, or already described through the literature, as well as recorded by drug users through online websites reporting new trends and experimentations of drug abuse. It explores the pharmacological effects of these substances and their potential for abuse, dependence, and overdose. Additionally, it discusses the dangers of polydrug use, as individuals often combine multiple substances to potentiate their desired effects.

Overall, Healthcare professionals should be aware of potential prescription drugs diversion, recognize misuse cases, consider the possibility of polydrug misuse, and prevent it where possible. Pharmacists can play a key role in preventing and reducing drug abuse and should be involved in evidence-based actions to detect, understand and prevent drug diversion activities and the adverse effects of drug-misuse.

Keywords: Drug-misuse; Drug-abuse; Prescription drugs; Over-the-counter drugs; Over dose

1. Introduction

The misuse and abuse of substances have been a persistent concern throughout human history. While traditionally, illicit drug use has centred around substances like cocaine, heroin, and marijuana, there has been a growing trend in recent years involving the misuse of prescription and over-the-counter [OTC] medications to achieve intoxication. [1]. Drug misuse is the term which defines as intentional use of medicinal product by inappropriately and not in accordance with the terms the marketing authorisation such as incorrect dose, taken at incorrect time, indication or schedule. Drug abuse is an insistent or erratic, intentional excessive use of medicinal product, taken to get high, inflict self-harm complemented by harmful physical and psychological effects. The phenomenon involving the non-medical use and misuse of prescription and OTC medications is called as Pharming. This emerging issue has raised significant public

* Corresponding author: ZULEKA AMBRIN

health and societal concerns, necessitating a comprehensive review to understand the scope, motivations, risks, and implications associated with this phenomenon [2].

Over the counter drugs [OTC], also known as off the shelf medication, are drugs that do NOT require a doctor's prescription and can be bought off-the-shelf in a pharmacy, and in stores such as supermarkets or small convenience stores. In many countries, OTC drugs are selected by a regulatory agency to ensure that they are ingredients that are safe and effective when used without a physician's care. As a general rule, over-the-counter drugs have to be used primarily to treat a condition that does not require the direct supervision of a doctor and must be proven to be reasonably safe and well tolerated. In the United States some over-the-counter cold and allergy medicines are being moved behind the counter at pharmacies as part of the fight against illegal drug production.

Examples of Over-the-Counter Drugs: Acetaminophen [Tylenol]; Ibuprofen [Advil, Motrin]; Decongestants, Aspirin.

A prescription drug [prescription medication or prescription medicine] is a pharmaceutical drug that legally requires a medical prescription to be dispensed. In contrast, over-the-counter and behind-the-counter drugs can be obtained without a prescription. A prescription drug requires a medical diagnosis and decision by a licensed healthcare professional as to which medicine is used, and is only intended for use by one person. Prescription medication can only be dispensed from a pharmacy [community, online, or mail-order] by a licensed pharmacist. In North America, the term "Rx" is often used as a short form for prescription drug.

Examples of Prescription Drugs: Antibiotics; Statins; Antidepressants; Sleeping pills. [3]

Several factors contribute to the illicit use of prescription and OTC drugs for intoxication purposes. One significant factor is the misconception that these medications are safer than illicit drugs. Due to their legal status and familiar packaging, individuals may perceive them as less harmful, leading to a false sense of security. Moreover, the accessibility of these drugs, whether through personal prescriptions, sharing among peers, or easily purchasing OTC drugs, contributes to their misuse.

Another driving force behind this trend is the desire for specific effects or experiences. Prescription and OTC drugs can produce various psychoactive effects, such as euphoria, relaxation, or altered states of consciousness. Some individuals seek to enhance or modulate their mood, alleviate stress, or escape from reality. The ease of access and diverse range of available drugs make them attractive options for those seeking alternative ways to achieve intoxication.

Healthcare professionals, women, older persons, and adolescents and young adults are among the vulnerable categories who are more likely to misuse drugs. Individuals with mental diseases, prisoners, and those experiencing either acute or chronic pain are among the other at-risk populations may misuse prescription opiates. [4]

The illicit use of prescription and over-the-counter drugs for intoxication purposes is a complex and multifaceted issue with significant implications for individuals, communities, and public health. Understanding the motivations, risks, and consequences associated with this phenomenon is crucial for developing effective prevention strategies, raising awareness, and promoting responsible medication use. pharmacists are essential in the fight against the illicit use of prescription and OTC drugs by ensuring the safe and appropriate use of medications, adhering to regulations, and actively engaging in education and prevention efforts.

2. Scope and prevalence of drug misuse

2.1. Overview of the types of OTC and prescription drugs commonly misused

Misuse of both over-the-counter [OTC] and prescription drugs is a significant public health concern. Here's an overview of the types of OTC and prescription drugs commonly misused:

2.1.1. OTC Drugs

- **Antihistamines:** Certain OTC antihistamines, such as diphenhydramine, can cause sedation and have psychoactive effects when taken in high doses.
- **Cough and Cold Medications:** Some cough and cold medications contain dextromethorphan [DXM], which, when taken in excessive amounts, can produce hallucinogenic effects.

- **Pain Relievers**: OTC pain relievers like acetaminophen [paracetamol] and nonsteroidal anti-inflammatory drugs [NSAIDs] can be misused for their analgesic properties or to enhance the effects of other substances.

2.1.2. Prescription Drugs

- **Opioids**: Prescription opioids, including drugs like oxycodone, hydrocodone, and fentanyl, are powerful painkillers that can lead to dependence and addiction when misused.
- **Central Nervous System [CNS] Depressants**: These medications, such as benzodiazepines [e.g., alprazolam, diazepam] and barbiturates, are prescribed for anxiety, sleep disorders, and seizures. Misuse can result in sedation, relaxation, and euphoria.
- **Stimulants**: Prescription stimulants like amphetamines [e.g., Adderall] and methylphenidate [e.g., Ritalin] are commonly prescribed for attention-deficit hyperactivity disorder [ADHD] and narcolepsy. They are misused for their stimulant effects, including increased energy and focus.

2.1.3. Other Prescription Medications:

- **Sedative-Hypnotics:** Sedative-hypnotic medications, such as zolpidem [Ambien] and eszopiclone [Lunesta], are prescribed for insomnia. Misuse can lead to sedation, memory problems, and impaired coordination.
- **Antidepressants:** Certain antidepressants, particularly selective serotonin reuptake inhibitors [SSRIs] and serotonin-norepinephrine reuptake inhibitors [SNRIs], may be misused for their mood-altering effects.
- **Antipsychotics:** Prescription antipsychotics, like quetiapine [Seroquel] and risperidone [Risperdal], are used to treat psychotic disorders. They may be misused for their sedative properties or to enhance the effects of other substances.

2.2. Discussion of the demographic factors and motivations behind drug misuse

Drug misuse is a complex issue influenced by a variety of demographic factors and underlying motivations. While it is important to note that drug misuse can affect individuals from all walks of life, certain demographic factors have been found to be associated with higher rates of drug misuse. These factors include age, gender, socioeconomic status, and education level. Additionally, there are various motivations that can contribute to drug misuse, such as seeking pleasure or euphoria, self-medication for physical or psychological pain, peer pressure, and curiosity.

- Age: Certain age groups may be more prone to drug misuse. Adolescents and young adults, for example, may experiment with drugs due to curiosity, peer influence, or a desire for social acceptance. Older adults may misuse prescription drugs due to chronic pain or other age-related health issues.
- Gender: While drug misuse affects both genders, studies have shown that men tend to have higher rates of substance abuse compared to women. However, the gap has been narrowing in recent years. Women may be motivated by factors such as stress, trauma, or self-medication for mental health issues.
- Socioeconomic status: Individuals from lower socioeconomic backgrounds may face increased risk factors for drug misuse. Factors such as limited access to education, unemployment, poverty, and lack of resources or support systems can contribute to drug misuse as a coping mechanism or escape from adverse circumstances.
- Education level: Lower educational attainment has been associated with higher rates of drug misuse. Education provides individuals with knowledge, skills, and opportunities that can reduce the likelihood of engaging in risky behaviors such as drug misuse.

As for the motivations behind drug misuse, they can vary from person to person. Some common motivations include:

- Pleasure and euphoria: Some individuals may turn to drugs as a way to cope with physical or psychological pain. They may misuse substances to alleviate symptoms of depression, anxiety, trauma, or other mental health issues.
- Self-medication: Some individuals may turn to drugs as a way to cope with physical or psychological pain. They may misuse substances to alleviate symptoms of depression, anxiety, trauma, or other mental health issues.
- Peer pressure: Social influences and the desire to fit in with a particular group can lead individuals to experiment with drugs, even if they may not have a strong personal motivation initially.
- Curiosity and experimentation: Some individuals may try drugs out of curiosity or a desire to explore altered states of consciousness.
- Escapism: Drug misuse can provide an escape from reality or help individuals temporarily avoid dealing with problems, stress, or difficult emotions. [5]
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3. Misuse of otc drugs for recreational purposes

3.1. Exploration of commonly misused OTC drugs and their effects

3.1.1. Anti-histamines

Diphenhydramine

Diphenhydramine is an over-the-counter medication commonly used for the treatment of allergies, hay fever, and sleep disturbances. It belongs to a class of drugs known as antihistamines, which work by blocking the effects of histamine, a chemical released by the body during an allergic reaction. While diphenhydramine is generally safe when used as directed, it can be subject to abuse and misuse.

Abuse of diphenhydramine refers to the intentional use of the medication in higher doses or for purposes other than its intended use. Some individuals may misuse diphenhydramine seeking its sedating effects, as it can induce drowsiness and promote sleep. This can be particularly appealing for those struggling with insomnia or seeking a recreational high. However, it's important to note that abusing diphenhydramine can have serious consequences.

Taking excessive doses of diphenhydramine can lead to a range of adverse effects. These can include dizziness, confusion, blurred vision, dry mouth, urinary retention, and an increased heart rate. In severe cases, overdose can occur, which may result in seizures, hallucinations, delirium, and even cardiac arrhythmias. Additionally, combining diphenhydramine with other substances, such as alcohol or certain medications, can further intensify the risks and complications.

Acute effects

- Psychiatric effects: euphoria, altered mental status, hallucinations, and/or psychosis;
- Physical effects: tachycardia, xerostomia, mydriasis, blurred vision, ileus, urinary retention, CNS depression, agitation, and hyperactivity

Chronic effects**:** dependence. [6,7,8]

Chlorpheniramine

Chlorpheniramine acts primarily as a potent H1 antihistamine drug. Moderate anticholinergic activity. Chlorpheniramine has been found to act as a serotonin reuptake inhibitor.

Acute effects

- Psychiatric effects: Sedating and anxiolytic properties;
- Its abuse has been related to pleasurable feelings such as euphoria and stimulating effects;
- It may be associated with psychotic symptoms in predisposed individuals [e.g., people with mental illnesses or individuals concomitantly abusing other drugs].

Chronic effects: Dependence

- Drug dependence is recorded after long-term use
- Withdrawal symptoms, including excessive irritability, anger outbursts, insomnia, sweating, and craving
- Street names and brand names: "Triple c" refers to Coricidin® cough and cold tablets; the combination of codeine, methyl ephedrine chlorpheniramine, and caffeine is marketed as Bron®; Panadol® is a combination of chlorpheniramine, paracetamol and pseudoephedrine; Advil® includes ibuprofen, chlorpheniramine and phenylephrine; other brand names: Polaramine®, Chlortrimeton® [9]

Promethazine

It is an antagonist of the H1 receptor, a derivative of phenothiazine, and a direct antagonist of the dopamine [D2] and muscarinic [M1] receptors. This substance is categorized as a first-generation antihistamine, capable of quickly passing through the blood-brain barrier and having negative side effects like sedation.

Acute effects

- Overdosage may result in antimuscarinic delirium, agitation, and neuroleptic malignant syndrome. Mild sedation and CNS depression to profound hypotension, respiratory depression, unconsciousness, and abrupt death.
- It may be used to increase the effects of other medications that are being used, such as opioids.

NR FOR CHRONIC EFFECTS

- Dependence might develop after long-term use of promethazine cough mixtures [containing opioids]
- Street names and brand names: Promethazine combined with alcohol or a soft drink is referred to as "Texas tea," "purple drank," "lean," or "syzzurp"; Common brand names are Phenadoz® and Phenergan®. [10]

3.1.2. Cough and cold medications

Dextromethorphan

Dextromethorphan [DXM] is an over-the-counter [OTC] medication commonly found in cough syrups and cold remedies. While intended for legitimate medical use to relieve cough symptoms.

At therapeutic doses, dextromethorphan produces minimal analgesic and antitussive effects. At high doses, acting as a N-methyl-D aspartate receptor antagonist, it produces the hallucinogenic and dissociative effects, which are recreationally searched. Neurobehavioural effects are dose-related, ranging from a mild to moderate stimulation with restlessness and euphoria [at 100-200 mg doses], to a dissociated state characterised by hallucinations, paranoia, perceptual distortions, delusional beliefs, ataxia, and out-of-body experiences at doses >1000 mg, these experiences are referred to as ‘robo-ing’, ‘robo-copping’, or ‘robo-tripping’ .

Neurobehavioural effects begin within 30–60 min of ingestion and persist for approximately 6 hours.

They are dose-related, starting from a mild to moderate stimulation with restlessness and euphoria [100–200 mg], to a state characterized by hallucinations, paranoia, perceptual distortions, delusional beliefs, ataxia, and out-of-body experiences [>1,000 mg]

Acute effects

- Psychiatric effects: euphoria, altered mental status, mania, mood lability, irritability, dysphoria, insomnia;
- Physical effects: tachycardia, hypertension, vomiting, mydriasis, diaphoresis, nystagmus, dystonia, loss of motor coordination.

Chronic effects

- Toxic psychosis and cognitive deterioration;
- Folate deficiency and neuropathy;
- Since DXM is produced as the crystalline hydrobromide salt, bromism is a rare consequence that has been identified in heavy chronic abusers of DXM [neurotoxic effects, resulting in somnolence, psychosis, seizures, and delirium.

Although DXM is not thought to have addictive properties, its chronic use might determine addiction due to GABAergic/antiglutamatergic mechanisms, including substance-taking compulsive behaviors, tolerance, and autonomic withdrawal symptoms

Street names: “Bromage,” “Brome,” “Candy,” “Dex “Dextro,” “DM,” “Drex,” “DXM,” “Red Devils,” “Robo,” “Rojo,” “Skittles,” “Triple C,” “Tussin,” “Velvet,” and “Vitamin D,” “Poor Man’s Ecstasy”; the practice of using large amounts of DXM to achieve psychoactive effects is known as “robotrippin.” Common brand names are: Balminil DM®, Benylin DM®, Bronchophan®, Buckleys D®, Calylin #1, Delsym®, Koffex DM®, Novahistex DM®, Robitussin® [11,12,13,14,15,16,17,18,19]

3.1.3. Anti-diarrheal

Loperamide

- Common anti-diarrheal medication called loperamide binds to opioid receptors in the GI tract, reducing peristalsis and raising sphincter tone [20].
- Loperamide does not have any cross-central opioid effects at therapeutic levels [2 mg, with a maximum dosage of 16 mg]; nonetheless, at large dosages [50–800 mg], it may be abused recreationally to produce a "lope high" [informally referred to as "lope high"] [21].
- It might be employed to control and deal with the withdrawal effects of opioids. [22,23,24,25]

- Loperamide toxicity can have fatal effects on the gastrointestinal system [nausea, vomiting, constipation], central nervous system [respiratory depression, altered mental status, miosis], and cardiovascular system [ventricular dysrhythmias and electrocardiogram alterations, such as prolonged QT, QRS widening, and torsade's-de-pointes]. The majority of these cases involved single-agent loperamide abuse and cardiotoxicity [26-27], and loperamide exposures reported to the NPDS consistently indicated intentional misuse and abuse. From 2010 to 2015, there was a 91% increase in reported exposures, totalling 201 and 383 exposures, respectively. The Food and Drug Administration [FDA] has restricted loperamide container sizes since September 2019 in an effort to decrease inappropriate use [28].

3.1.4. Hyoscine butylbromide

Hyoscine butylbromide, also referred to as scopolamine butylbromide, is a regularly prescribed anticholinergic medication that is derived from plants. For the symptomatic alleviation of irritable bowel syndrome, to reduce intestinal and other smooth muscle spasms, and as a premedication in anaesthesia, a dose of 10 mg or more is recommended. Young people frequently use and abuse it as a psychoactive substance, and they get it from branded goods like Buscopan® [29] .

At supratherapeutic dosages [from 1.2 mg as a single dose, while the recommended dose for adults is one to two tablets of 0.3 mg as a single dose] it exerts potent CNS effects, including restlessness, excitement, euphoria, disorientation, irritability and characteristic delirium-like states with auditory/visual/and tactile hallucinations, altered mood, insomnia and cognitive dysfunctions [30, 31].

3.1.5. Codeine

It is a selective agonist of the mu-opioid receptor; it is a natural isomer of methylated morphine, requiring metabolic activation by O-demethylation to morphine by CYP2D6.

Acute effects

- psychiatric effects: euphoria, elation, analgesia, calmness;
- physical effects: respiratory depression, extreme somnolence progressing to stupor or coma, skeletal muscle flaccidity, cold and clammy skin, and sometimes bradycardia and hypotension. The triad of coma, pinpoint pupils, and respiratory depression is strongly suggestive of opiate poisoning. In severe overdosage, death may occur

Chronic effects: dependence

- Codeine has an identified abuse liability potential, given its effect and development of tolerance within a short time frame on regular or excessive use.[32]

4. Misuse of prescription drugs for recreational purposes

Prescription drug abuse has become a concerning modern-day epidemic, especially in young adults and adolescents where their use has surpassed all illicit drugs with the exception of marijuana. Traditionally concern has centred on opioids, benzodiazepines, and stimulants, but other widely prescribed drugs may be misused, abused or diverted for nonmedical purposes. Young people take prescription drugs for recreational purposes -[e.g. to get 'high']; to relieve anxiety or relax; or to improve academic performance. Drugs might be acquired from friends or relatives, directly prescribed by a doctor, from a drug dealer, or via the internet [33].

4.1. Quetiapine

Quetiapine is an atypical antipsychotic medication primarily prescribed to manage conditions like schizophrenia, bipolar disorder, and major depressive disorder. However, in recent years, there has been growing concern over its misuse and abuse, especially among individuals seeking an illicit high.

One of the main reasons for quetiapine's misuse is its sedative effect. Some users seek the drug for its strong drowsiness-inducing properties, often taken in larger doses than prescribed to achieve a sense of relaxation or euphoria. This misuse can lead to various adverse effects, including dizziness, confusion, blurred vision, and impaired motor skills, which can pose serious risks, particularly when driving or operating heavy machinery.

Furthermore, quetiapine misuse can have severe health consequences. Overdosing on this medication can lead to potentially life-threatening conditions, such as seizures, cardiac complications, and severe respiratory depression. The combination of quetiapine with other substances, such as alcohol or opioids, can amplify these risks, further emphasizing the dangers of it's misuse. [34,35]

4.2. Z-drugs [zolpidem, zaleplon, zopiclone]

Z-drugs, which were introduced in the 1980s as a short-term treatment for insomnia, were initially believed to have a more favorable and safer profile compared to benzodiazepines. This was attributed to their receptor selectivity and improved pharmacokinetic properties [36].

Z-drugs exert significant hypnotic effects by reducing sleep latency and improving sleep quality through increased transmission of γ-aminobutyric acid [GABA] at the GABA-type A receptor, similar to benzodiazepines. However, in recent years, concerns have arisen regarding the safety of Z-drugs due to issues of abuse, dependence, drug-assisted sexual assaults, and dangerous sleep behaviors such as sleep eating, sleep driving, and sleepwalking. Problematic use of these hypnotic drugs has been observed in male and young recreational users who consume high doses, often in combination with other licit or illicit drugs through intranasal or intravenous administration [37].

Another population at risk for Z-drug abuse comprises long-term users, including patients with mood/neurotic disorders, substance use disorders [SUDs], and older individuals who initially used Z-drug hypnotics for insomnia but later found it difficult to reduce the dosage due to withdrawal symptoms [38]. Both zolpidem and zopiclone present a similar risk for dependence, although zopiclone is more commonly associated with overdose adverse drug reactions and illicit trade [39]. Similar to benzodiazepines, Z-drugs have been classified as Class C and Schedule 4 substances under the Misuse of Drugs Act and Regulations since 2013 [40].

4.3. Gabapentinoids

Gabapentinoids, a class of drugs that includes gabapentin and pregabalin, have been increasingly associated with drug abuse and the pursuit of illicit highs.

Originally developed as anticonvulsant medications, they are commonly prescribed for the treatment of neuropathic pain, epilepsy, and anxiety disorders. pregabalin is considered to have a higher abuse potential due to its rapid absorption, faster onset of action and higher potency [41]. Death, physical dependence, and the propensity to cause depression of the central nervous system [CNS], especially when used in combination with opioids and sedatives are harms identified for both gabapentinoids [42].

The principal population at risk for addiction are those with other current or past SUD [substance use disorder], mostly opioid and polydrug users [43]. Opioid users often misuse pregabalin to self-treat physical pain, to achieve a desired psychoactive effect [e.g. potentiate the effects of heroin/cocaine], and combat opioid withdrawal symptoms [44]. Moreover, rates of pregabalin misuse-related ambulance attendances have increased markedly over the past 10 years, e.g. in Australia from 0.28 cases per 100 000 population in the first half of 2012 to 3.32 cases per 100 000 in the second half of 2017. Thus, pregabalin and gabapentin were found to have the potential for misuse, addiction, and overdose [45].

4.4. Bupropion

Bupropion is a second-generation Anti-depressant that acts as a selective inhibitor of catecholamines' [noradrenaline and dopamine] reuptake, devoid of any serotonergic; antihistamine; or anticholinergic properties [46]. Furthermore, bupropion is a non-competitive antagonist of nicotinic acetylcholine receptors [47], hence being prescribed for both major depressive episodes and as an aid in smoking cessation [48].

A 14-year retrospective review showed that 975 single substance bupropion cases were reported to the National Poison Data System [NPDS] with "intentional abuse" as the coded reason for exposure in individuals aged 13 and older. The prevalence of abuse increased by 75% from 2000 to 2012, and mostly involved adolescents and young adults, who reported clinical effects of tachycardia, seizures, and agitation/irritability [49]. Its recreational use by oral/nasal/intravenous routes has been reported, with people misusing the drug to get a ‘high’ similar to the one obtained through other stimulants, such as cocaine. [50-52]

4.5. Venlafaxine

Venlafaxine is an antidepressant in the serotonin-norepinephrine reuptake inhibitor class.

Its recreational use is related to its reuptake inhibition with dose-dependent effects on selective serotonin [5-HT] transmission at low doses [150 mg/day]; and on dopamine at high doses [>300 mg/day] [53]. Large venlafaxine dosages might be consumed to produce amphetamine/ecstasy-like effects, with euphoria and increased sociality, and dissociative effects including distorted sense of time and “numbness” described [54].

Patients with prior SUD, e.g. opioid abuse/dependence, appeared to be more vulnerable to venlafaxine misuse [55]. Fatalities have been reported relating to numerous overdose cases with associated symptoms of tachycardia, seizures, coma, and serotonin syndrome; moreover, dependence issues after long term use have been described [56].

A retrospective review of venlafaxine exposures reported to the NPDS from 2000 to 2016 described 752 intentional-abuse venlafaxine exposures on the total of 85,621, with prevalence decreasing from 107/10,000 venlafaxine exposures in 2000 to 59.3/10,000 in 2016. Median age was 23 years and 50% were female. Primary route was ingestion [90.8%] with 4.7% using venlafaxine via inhalation/intranasal administration. The most frequent clinical effects reported were tachycardia [33.9%], drowsiness [20.7%], and agitation [11.5%] [57].

5. Challenges in regulating the misuse of otc and prescription drugs

Regulating the misuse of over-the-counter [OTC] and prescription drugs presents several challenges:

- Self-Medication: OTC drugs are readily available without a prescription, making them susceptible to self-medication. People may misuse them by not following dosing instructions or using them for unintended purposes.
- Prescription Drug Abuse: Prescription drugs, when misused, can lead to addiction and health risks. Regulating them is complicated due to the need for patient access to essential medications while preventing misuse.
- Internet Pharmacies: The online sale of OTC and prescription drugs makes it challenging to enforce regulations, as some websites may operate illegally or sell counterfeit medications.
- Doctor Shopping: Individuals may seek multiple doctors to obtain multiple prescriptions, leading to overuse or diversion of prescription drugs.
- Inadequate Education: Many people lack awareness of the risks associated with drug misuse and the importance of proper usage, highlighting the need for public education campaigns.
- Opioid Crisis: The misuse of prescription opioids has become a significant public health concern, leading to overdose deaths and challenges in regulating the pharmaceutical industry.
- Regulatory Gaps: Regulatory bodies often struggle to keep pace with new drugs and emerging trends in drug misuse, creating gaps in oversight and enforcement.
- Stigma and Reporting: Stigma associated with substance abuse can hinder reporting of misuse, making it difficult to gather accurate data and respond effectively.
- Access to Treatment: Ensuring access to addiction treatment services for those struggling with drug misuse is essential but often lacks adequate resources and infrastructure.
- International Trade: The global nature of the pharmaceutical industry makes it challenging to regulate the production and distribution of drugs, especially across borders.

Addressing these challenges requires a multifaceted approach, including stronger regulation, improved education, better monitoring, and expanded access to addiction treatment services.[58]

6. Pharmacist's role in drug abuse prevention, education, and assistance

Pharmacists play a crucial role in drug abuse prevention education and assisting in the misuse of prescription and over-the-counter [OTC] drugs for intoxication. Here are some ways in which pharmacists contribute to these efforts:

- Patient education: Pharmacists can provide education to patients about the potential risks and dangers associated with drug abuse. They can explain the proper use of prescription and OTC medications, including the importance of following dosage instructions, avoiding combining certain medications, and the potential for addiction or harmful interactions.
- Prescription monitoring: Pharmacists play a key role in monitoring prescription drug use. They can identify patterns of excessive or inappropriate medication use, such as early refills or multiple prescriptions from different doctors. By recognizing these patterns, pharmacists can intervene and communicate their concerns to healthcare providers or authorities as appropriate.
- Controlled substance regulations: Pharmacists are responsible for dispensing controlled substances, such as opioids, in accordance with strict regulations. They must verify the legitimacy of prescriptions, confirm the patient's identity, and ensure that the prescribed medication is appropriate for the patient's condition. By adhering to these regulations, pharmacists help prevent the illicit use of prescription drugs.
- Over-the-counter medication counselling: Pharmacists can provide counselling to individuals seeking OTC medications that may be misused for intoxication purposes, such as cough and cold medications containing

dextromethorphan [DXM]. They can explain the potential risks associated with high doses of these medications and advise on alternative treatments for the underlying condition.

- Collaboration with healthcare professionals: Pharmacists often collaborate with other healthcare professionals, such as physicians and addiction counsellors, to identify patients at risk of drug abuse and develop comprehensive treatment plans. They can provide valuable input regarding medication choices, potential interactions, and non-pharmacological alternatives.
- Referral to addiction resources: Pharmacists can refer individuals struggling with drug abuse to appropriate addiction resources, such as rehabilitation center's, support groups, or counselling services. They can provide information about available resources and help connect patients with the necessary support systems.

Overall, pharmacists are essential in drug abuse prevention education and assisting in curbing the illicit use of prescription and OTC drugs. They contribute by educating patients, monitoring prescription drug use, adhering to controlled substance regulations, providing counseling, collaborating with healthcare professionals, and referring individuals to addiction resources. [59,60]

7. Conclusion

Overall, the review article demonstrated that over-the-counter [OTC] and prescription drug usage is a growingly important health concern linked to possible side effects, such as drug-related toxicity, addiction, and mortality. Currently, the CoViD-19 pandemic has probably made it easier for the incidence of these abusive behaviours, as more users turned from street drugs to prescription/OTC products. Indeed, OTC and prescription drugs are both widely accessible and perceived because of their favorable legal status as relatively safe, hence accepted in a "pill-popping culture"

Pharmacists are in a unique position to identify and intervene in cases of drug abuse and misuse. They are often the last healthcare professionals to interact with patients before they receive their medications, giving them an opportunity to detect signs of potential abuse or diversion. Pharmacists can be vigilant in monitoring prescription patterns, identifying patients who may be doctor shopping or attempting to obtain multiple prescriptions for controlled substances.

In conclusion, the review article underscores the pivotal role of pharmacists in preventing drug abuse, illicit use of prescription drugs, and the misuse of over-the-counter medications. Through their expertise, vigilance, patient education, and collaboration with other stakeholders, pharmacists can contribute significantly to mitigating the harm caused by drug abuse and promoting public health and safety.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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