



MISUSE OF PRESCRIPTION AND OVER-THE-COUNTER DRUGS: A REVIEW ARTICLE

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Abstract: Self-care and self-medication are important aspects of any health-care system. The self-medication procedure includes the usage of over-the-counter (OTC) drugs. The popularity of over-the-counter drugs among patients may raise their abuse potential. Due to its accessibility, pharmacists are often the first contact point for patients and have the opportunity to educate and advise patients on the proper use of OTC medications. This article briefly describes the potential for OTC substance abuse and the effects of self-medication on OTC substance abuse. This review further discusses the barriers pharmacists face when treating OTC drug abuse, given the increasing likelihood of switching from prescription drugs to OTC drugs in recent years. In addition, the potential categories of medicines behind counters to improve patient-pharmacist interactions were discussed. This study adds to the body of knowledge about the challenges pharmacists confront in preventing OTC medicine addiction and creating effective intervention techniques.

Keywords: drug abuse; prescription drug misuse; over-the-counter drug abuse.

INTRODUCTION:

A prescription, often abbreviated R or Rx, is a formal communication from a physician or other registered health-care professional to a pharmacist, authorizing them to dispense a specific prescription drug for a specific patient. Historically, it was a physician's instruction to an apothecary listing the materials to be compounded into a treatment—the symbol R (a capital letter R, crossed to indicate abbreviation) comes from the first word of a medieval prescription, Latin: Recipere (Take thou), that gave the list of the materials to be compounded. A doctor's prescription for a pharmacist to dispense a specific quantity of a specific medicine in a specific dose. A prescription also includes directions for the patient, such as how to take the drug, how often to take it, and how long to take it. Prescription drug abuse has become a major public health issue, as it can lead to addiction and even death from overdosing. [11]



Figure 1: Sample of a prescription [18]

Over-the-Counter drugs:

Over-the-counter (OTC) medications are those that can be purchased without a prescription. Individuals can self-manage symptoms by purchasing over-the-counter (OTC) drugs from pharmacies. There are brand names, generic names, and store brand names for OTC drugs (similar to prescription medications). If the concentration of the active ingredients is the same, generic, store, and brand names contain the same active ingredients and have the same action on the body. This article discusses some of the most widely overused OTC medicines, as well as their side effects. Over-the-counter drugs are used to treat a wide range of ailments and symptoms, such as pain, coughs and colds, diarrhea, nausea, and so on. OTC drugs contain active chemicals that have the potential to be abused at higher-than-recommended doses, and they are becoming increasingly popular due to the possibility of diversion to achieve central psychoactive effects. OTC drugs are used to treat and prevent a variety of ailments, including headaches, the common cold, musculoskeletal discomfort, allergies, tobacco addiction, and heartburn. [20]

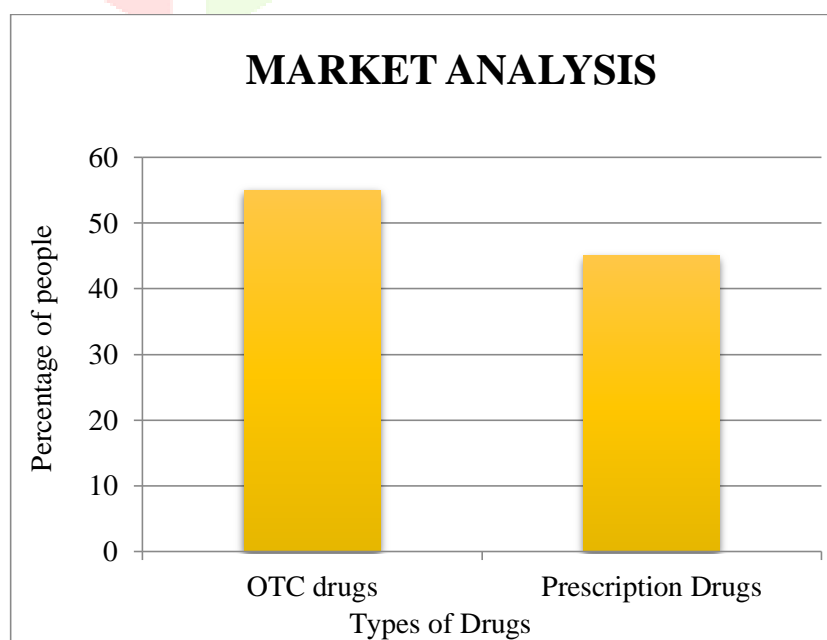


Figure 2: Market Analysis of OTC and prescription drugs [12]

Taking a medication in a way or dose other than prescribed; taking someone else's prescription, even if for a legitimate medical complaint such as pain; or taking a medication to feel euphoria are all examples of prescription drug misuse (i.e., to get high). These types of misuse are referred to as nonmedical use of prescription medications. The following are the three types of medications that are most typically misused: opioids—usually prescribed to treat pain, central nervous system [CNS] depressants (this category includes tranquilizers, sedatives, and hypnotics)—used to treat anxiety and sleep disorders, stimulants—most often prescribed to treat attention-deficit hyperactivity disorder [21]

More than 80% of older patients (ages 57 to 85) take at least one prescription medicine on a daily basis, with more than 50% taking five or more prescriptions or supplements on a daily basis. This can result in health problems if you use a prescription drug in a way that isn't prescribed, or if you use it for reasons other than what it was intended for. Medication (and other substance) usage is more risky in older individuals than in younger people due to the high incidence of various (comorbid) chronic conditions, age-related changes in drug metabolism, and the possibility for drug interactions. [22] Furthermore, many older persons use over-the-counter drugs, as well as dietary and herbal supplements, which could exacerbate any negative health effects from nonmedical use. Furthermore, many older persons use over-the-counter medicines, as well as dietary and herbal supplements, which could exacerbate any negative health effects from non-medical prescription drug usage. [23]

EXAMPLES OF OTC Drug Categories
Antacids and Acid Reducers
Antiemetic Medicines
Antidiarrheal
Antihistamines
Cough Medicine
Decongestants
Laxatives
Pain Killers

Table 1: Types of OTC drugs

- **Misuse of opioid drugs:**

Opioids are drugs that lessen the strength of pain signals by acting on opioid receptors in the spinal cord and brain. They also have an effect on the parts of the brain that control emotion, which can lessen the impact of painful stimuli even more. They've been used to cure pain, cough, and diarrhoea for millennia. Opioids are most commonly used nowadays to relieve acute pain. [2]

As a result of opioid medication, some patients experience a worsening of pain or greater sensitivity to pain, a condition known as hyperalgesia. Importantly, in addition to alleviating pain, opioids engage reward centres in the brain, resulting in euphoria—or a high—that can lead to overuse and substance use disorder. Because opioids interact with regions of the brain stem that control respiration, overdose is a serious risk. An opioid overdose can cause suffocation if the user's breathing is suppressed to the point of suffocation.

If the drug naloxone is given quickly enough, an overdose can be reversed (and death avoided). Morphine is commonly recommended for severe pain before and after surgical procedures, while codeine is typically prescribed for moderate discomfort. Some of these medications, such as codeine and diphenoxylate, are used to treat coughs and severe diarrhoea in addition to reducing pain. [2] [3] [4]

- **Effects of Opioids on brain and body:**

Opioids work by binding to and activating opioid receptor proteins on nerve cells throughout the body, including the brain, spinal cord, gastrointestinal system, and other organs. When these medications bind to their receptors, they stop pain signals from being transmitted. Opioids can also cause sleepiness, mental confusion, nausea, constipation, and respiratory depression, and because they work on reward-related brain regions, they can also cause euphoria, especially when taken in higher-than-recommended doses or administered in ways other than intended. [5]

- **Commonly misused CNS depressants:**

CNS depressants, a category that includes tranquilizers, sedatives, and hypnotics, are substances that can slow brain activity. This property makes them useful for treating anxiety and sleep disorders. [6]

- i. **Benzodiazepines:** Anxiety, acute stress reactions, and panic episodes are sometimes treated with benzodiazepines such as diazepam, clonazepam, and alprazolam. Seizure disorders and sleeplessness may also be treated with clonazepam. Short-term sleep disturbances are treated with benzodiazepines that are more sedating, such as triazolam and estazolam. Because of the considerable risk of developing tolerance, dependence, or addiction, benzodiazepines are rarely prescribed for long-term usage.
- ii. **Non-benzodiazepine sleep medications:** • Z-drugs like zolpidem, eszopiclone, and zaleplon have a different chemical structure than benzodiazepines, but they operate on the same GABA type A receptors in the brain. Compared to benzodiazepines, they are expected to have fewer negative effects and a lower risk of addiction.
- iii. **Barbiturates:** Because of their higher risk of overdose compared to benzodiazepines, drugs like mephobarbital, phenobarbital, and pentobarbital sodium are used less commonly to treat anxiety and sleep difficulties. They are, however, still employed in surgical procedures and in the treatment of seizures.

- **Effects of CNS depressants on the brain and body:**

Most CNS depressants work by raising activity at gamma-aminobutyric acid receptors, which are inhibitory neurotransmitter receptors (GABA).

Although different kinds of CNS depressants work in different ways, they all generate a sleepy or calming affect that is medically beneficial to patients suffering from anxiety or sleep disorders by enhancing GABA transmission and so increasing inhibition of brain activity. [6]

- **Consequences of CNS depressant misuse:**

Benzodiazepines and barbiturates, although their good therapeutic effects, have the potential for misuse and should only be used as prescribed.

Non-benzodiazepine sleep aids, also known as z-drugs, are less well-studied, but certain indicators have raised concerns about their misuse potential. When consumption is quickly reduced or terminated, it can lead to dependence and withdrawal.

Because CNS depressants function by reducing brain activity, there might be a rebound effect after someone stops taking them, resulting in seizures or other negative outcomes.

Although withdrawal from benzodiazepines might be difficult, it is rarely life-threatening, whereas withdrawal from barbiturates can be fatal. As a result, anyone considering quitting a CNS depressant or experiencing withdrawal symptoms after quitting should consult a physician or seek immediate medical attention. [6]

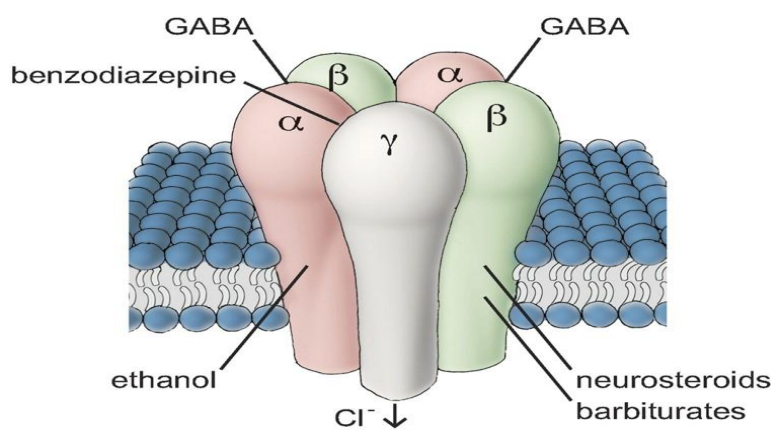


Figure 3: The GABA receptor [13]

- **Misuse of stimulants**

Stimulants raise blood pressure, heart rate, and breathing, as well as increasing alertness, focus, and energy. Stimulants have been used in the past to treat asthma and other respiratory difficulties, obesity, neurological diseases, and a range of other conditions. Stimulants are now only used to treat a few medical diseases, such as attention deficit hyperactivity disorder (ADHD), narcolepsy, and occasionally treatment-resistant depression. [7]

- **Effects of stimulants on brain and body**

Stimulants like dextroamphetamine and methylphenidate act on the monoamine neurotransmitter systems in the brain, which include norepinephrine and dopamine.[8] These compounds' effects are amplified by stimulants. The effects of these drugs on norepinephrine raise blood pressure and heart rate, constrict blood vessels, increase blood glucose, and open up breathing passages, and boost dopamine signalling from nonmedical use of stimulants can cause euphoria. [9]

OTC Drugs:

OTC drugs are those drugs which are safe and effective for use by general public without doctor's prescription. It is also called 'prescription de controlled drugs'. These drugs are non-prescription or over the counter drugs. It is used primarily for symptomatic relief and not as substitutes for prescription drugs.

Examples of Misused OTC drugs:

1. **Dextromethorphan (DXM):**

DXM is used to treat coughs brought on by the common cold. It's a non-opioid levorphanol congener with no analgesic or addictive effects. Antihistamines, decongestants, and expectorants are all utilised with DXM. Physicians should be on the lookout for this drug's abuse and misuse. People may abuse DXM by swallowing it, mixing it with soda for flavour (a practise known as "robo-tripping" or "skittling"), injecting it, or mixing it with other narcotics like marijuana or alcohol. Delsym, Robitussin Cough, and Vicks 44 are other examples. Common side effects include confusion, euphoria, irritability, anxiousness, and serotonin syndrome (rare). Patients taking monoamine oxidase inhibitors should avoid it (MAOIs).



Figure 4: Dextromethorphan syrup [16]

2. Loperamide:

Loperamide is a type of synthetic opioid used to treat diarrhoea. Loperamide can have a euphoric affect when taken in large enough dosages. Take, for example, Imodium A-D. Abdominal pain, constipation, nausea, sleepiness, dizziness, and dry mouth are all common side effects. Children under the age of 12 and those with bloody or black faeces are contraindicated. [14]



Figure 5: Side effects of loperamide tablets [15]

3. Pseudoephedrine/phenylephrine:

Decongestants containing pseudoephedrine or phenylephrine are used to relieve sinus congestion and pressure caused by the common cold, hay fever, or allergies. Because decongestants containing pseudoephedrine can be diverted to make methamphetamine, they are now sold "behind the counter," with pharmacies selling them in limited quantities and requiring photo identification (crystal meth). *Examples:* Sudafed (with pseudoephedrine) and Sudafed PE (with phenylephrine). Anxiety, arrhythmias, tachycardia, high blood pressure, headache, dizziness, tremor, and insomnia are all common side effects. Patients using MAOIs are contraindicated. Patients with heart disease, high blood pressure, diabetes, thyroid disease, or benign prostatic hypertrophy should use with caution.

4. Diphenhydramine (DPH):

DPH reduces allergic symptoms and induces drowsiness by acting on peripheral and central histamine H1 receptors, respectively. It's also found in sleeping pills. DPH is a competitive antagonist of muscarinic acetylcholine receptors, which means it might produce sinus tachycardia, dry mouth, mydriasis, blurred vision, ileus, urine retention, CNS depression, agitation, hyperactivity, or psychosis. DPH is utilised for a variety of medical conditions due to its many effects, which makes it vulnerable to overuse and misuse. It's misused for its behavioural effects, which include a boost in energy and a lack of euphoria. Benadryl Allergy, Nytol, and Sominex, for example. Drowsiness, dizziness, exhaustion, nausea, and urine retention are all common side effects. Benadryl is contraindicated in children under the age of two, Nytol and Sominex in children under the age of twelve, and in conjunction with other sedatives and alcohol.

5. Acetaminophen:

Acetaminophen is a lifesaver when it comes to mild aches and pains, especially headaches. However, many people abuse or misuse this prescription, resulting in 60,000 Americans being admitted to hospitals each year. Overdosing on acetaminophen can cause liver failure, and persistent use of this OTC medication can cause elevated liver enzyme levels, liver damage, and toxic hepatitis. Physicians should be aware that acetaminophen is found in a wide range of products, which can lead to an unintended overdose. Take Tylenol, for example. Drowsiness, hepatotoxicity (dose-related), nephrotoxicity (with chronic overdose), and hypersensitivity reactions are also common side effects (uncommon). Patients taking other acetaminophen-containing medications and those who consume 3 or more alcoholic beverages per day are contraindicated.



Figure 6: Acetaminophen tablet [17]

6. Oxybutynin transdermal system:

Despite being available over-the-counter, this medication should only be used after speaking with a doctor. Oxybutynin is used to treat overactive bladder in women who have experienced urge incontinence and urine urgency/frequency for more than three months. When this anticholinergic medicine is misused, it can cause fewer depressive symptoms, euphoria, and relaxation. Oxytrol (for women) and Ditropan XL are two examples. Sleepiness, dizziness, disorientation, dry mouth, constipation, and impaired vision are all common side effects.

7. Antacids:

Antacids are taken to relieve heartburn, acid indigestion, and a sour stomach. Bloating, pressure, and gas symptoms can be relieved with products containing simethicone, such as Maalox and Mylanta. Long-term usage of antacids, on the other hand, can result in "acid rebound." Acid rebound is a perplexing acid hypersecretory state accompanied by elevated gastrin levels. Antacids can also obstruct the absorption of a variety of prescription medications. In addition, the FDA published a statement in 2016 alerting consumers about the increased risk of significant bleeding when taking over-the-counter aspirin-containing antacid medications. Alka-Seltzer Heartburn, Tums, Maalox, Mylanta, milk of magnesia, and aluminium hydroxide are just a few examples (generic). Diarrhea (magnesium formulations) and constipation are two common side effects (aluminum preparations).

Symptoms	OTC Drugs
Cough / Common Cold /Fever	Corex Chericoff Lemolate Avil Deletus Metacin Calpol
GI ailments like Hyperacidity/ Constipation/ Diarrhoea/ Nausea	Digene Dulcolax Lomotil Unienzyme PAN D
Headaches/ Body aches/ Sprains	Ibuprofen Combiflam Cycoplam
Skin ailments like acne, rashes, cuts and burns	Soframycin Candid Betadine Caladryl
Nutritional supplements	Becosules Shelcal Yakult

Table 2: Most commonly misused OTC drugs and their categories with examples.

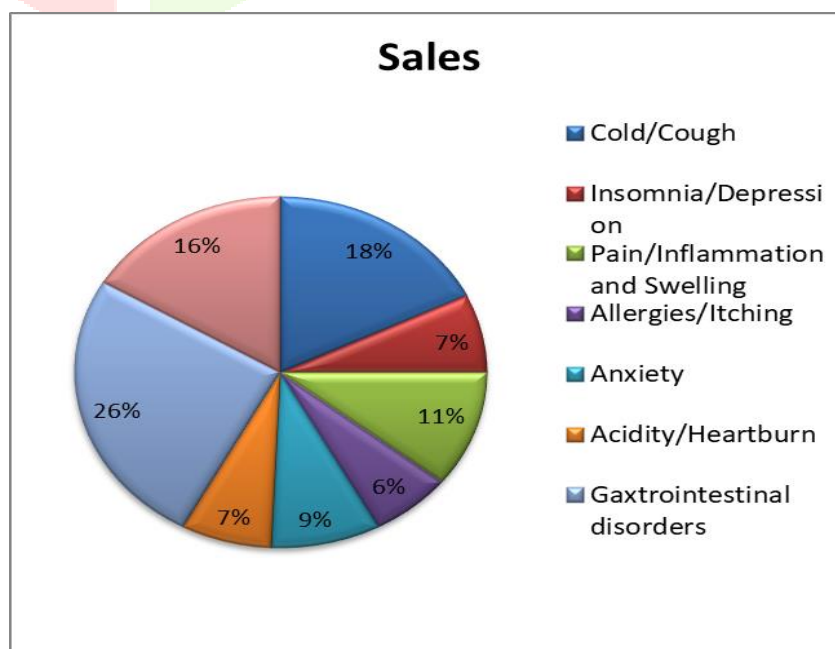
Pharmacists' role in drug abuse prevention, education and assistance:

As more users move from over-the-counter drugs to prescription/over-the-counter drugs, pharmacists need to be more vigilant when dispensing drugs and be aware of the potential for drugs to appear on the black

market. Pharmacists have long played an important role in substance abuse prevention and education, improving their services during and after a pandemic to support patients. As health care providers, they must participate in or contribute to the development of certain prevention and treatment programs for health care institutions or government services. They should also work with outpatient and outpatient care providers to avoid potentially dangerous drug prescribing practices (eg, prescribing more pain relievers than clinically necessary) and to prevent substance abuse after discharge. Pharmacists must engage in open communication to reassure patients and build trust, especially with vulnerable populations who may be less confident in communicating diversion and misuse issues to health care providers. A pharmacist can help identify people who may have a substance abuse problem and direct them to appropriate services, such as mental health services or substance abuse services. In addition, pharmacists should be involved in ensuring safe and effective drug use systems, including development of the drug treatment component of drug detoxification protocols and organizational responsibility for drug supply, distribution and management. [19]

Survey Analysis :

The study was conducted from November 2021 to December 2021 using a specially designed anonymous questionnaire consisting of forty six closed questions (tables) and a small statistics section. According to the survey conducted, 70% of the patients consumed OTC drugs which were used for common cold, body aches, fever etc. It was observed that due to the pandemic of COVID-19, there was a spike in the need of drugs like paracetamol and other analgesics, antipyretic drugs and antihistamines etc. to treat mild COVID symptoms like high fever, cold, and cough. It was also noted that some patients diagnosed with anxiety disorder, depression and insomnia purchased different types of sedatives and hypnotics using expired prescriptions and often bought them in bulk leading to abuse of same. Many individuals implied that the drugs which they bought for various symptoms were recommended to them by their acquaintances, family etc. without a definite prescription from a medical practitioner. However, younger patients used the internet and various online methods to self-diagnose themselves and prescribe drugs to their own selves related to the same without consulting any doctor which may lead to them consuming wrong drugs for their symptoms and can cause allergies. Sometimes, patients would come up with old or fake prescriptions in order to obtain stimulants, anti-depressants, cough syrups (whose possible side effects are sleepiness and fatigue) which were abused on a daily basis.



CONCLUSION:

This review of the OTC substance abuse literature shows that there are internationally recognized issues, including a variety of drugs and potential harm. Methodological concerns have arisen regarding the use of surrogate, self-reported, and non-OTC-specific data, and the relative lack of qualitative research on individual experiences of OTC substance abuse. These represent urgent areas of need for research. Investigate the scope of the problem, provide insights into the affected problem, and clarify the nature of the problem to be investigated. This study is needed to inform the policies, regulations, and willingness of many healthcare professionals to avoid harm to those who purchase OTC medicines that can be misused.

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