

## Over-the-Counter Drugs: Convenience or Danger? A Critical Review

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### ABSTRACT

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The overuse of over-the-counter (OTC) drugs poses significant health risks across various populations, including young adults, pregnant women, and the elderly. This review, based on previously published literature, examines the patterns of OTC drug usage, highlighting factors such as accessibility, lack of awareness, and self-medication. It explores the abuse potential of OTC medications and the varying levels of knowledge among users. Additionally, the role of pharmacists in educating consumers is discussed. The review emphasizes the adverse consequences of OTC misuse, including potential side effects and drug interactions. It concludes with recommendations to promote safe use and enhance public awareness about the risks associated with OTC medications.

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## Introduction

There is a trend found all over the world where people buy medicine on their own without a prescription from a doctor, which is called over-the-counter (OTC), such as pain relievers like aspirin and acetaminophen. The OTCs are also known as non-prescription drugs. A wide variety of over-the-counter (OTC) medicines are available to treat common ailments, including pain relievers, cough and cold remedies, antacids, vitamins, and nutritional supplements [1]. According to a study, OTC medicines are available widely in different brands, packages, sizes, formulations, and doses. People use them for different types of pain. Due to a lack of knowledge, some people believe firmly that a pharmacist could provide them with the best suggestions regarding their minor illnesses. They also believe that the pharmacist could provide quality pharmaceutical treatment to them. They feel that they can save time and money by visiting a pharmacist. When patients are affected by illnesses like cold, cough, fever, allergy, pain, acidity, diarrhea, and skin-related conditions, they visit a pharmacist. Many countries in the world allow over-the-counter medicines on legal standards. All items can be consumed without a prescription from a doctor [2]. On the contrary, some countries responded well to this act as they declared OTC medicines a separate category of drugs. They also established particular rules and regulations to prohibit this act in society. A report on global OTC markets stated that some countries contributed to OTC sales worldwide. These countries included Japan, Germany, the United Kingdom, and the United States. Meanwhile, countries like Australia, the United Kingdom, and the United States have completely formulated rules for the use and classification of OTC drugs [3]. The difference between prescription and OTC drugs is not crystal clear to everyone. For example, in New Zealand, low-dose ibuprofen (200 mg) was utilized as OTC, but the same ibuprofen with a high dose (400 mg, 600 mg, and 800 mg) required a prescription. The high-dose ibuprofen could not be used as OTC, it was prescribed to treat severe pain related to arthritis. However, people use low-dose ibuprofen for treating minor pains like headaches, etcetera [4].

Hedenurd et al. (2019) observed that consumers' behavior toward using over-the-counter medicines and taking risks had been under discussion, especially concerning highly potent pain relievers. According to an Australian investigation, outside of

pharmacies, the easy availability of over-the-counter medicines guided consumers to use them with a relaxed frame of mind, even though it might be unsuitable. Consumers are unaware of the increasing risk of using over-the-counter drugs [5]. A Swedish population study established that from the last stages of adolescence until the age of 25, youngsters recognized a lower risk of using these unprescribed drugs compared to older adults [6]. This review provides a comprehensive insight into the behavior of different groups of the population towards OTC use and the side effects of such drugs without prescription.

## Patterns of OTC Medication Use Among Young Adults

Tahlia et al., (2021) examined that self-management of OTC drugs is extremely common among young adults. There is a significant contribution from Australians during this era, as they spent roughly 5.4 billion dollars on over-the-counter medicines in 2018. Most of the adults who used at least one dose per month mainly relied on pain relievers. Over-the-counter pain relievers included paracetamol and non-steroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen, aspirin, naproxen, diclofenac, and mefenamic acid. Aspirin, paracetamol, and ibuprofen could be easily purchased from petrol stations and supermarkets without a pharmacist's prescription as general sales tax medications [7].

Young adults, especially those in their 20s, are responsible for the use of OTC drugs without any consultation with a doctor. This is because of a lack of awareness about potential harm to their health. The inappropriate usage of OTC drugs and the subsequent likelihood of danger could increase day by day if this behavior is not changed. Young people are more likely to engage in this adventurous attitude if they perceive little risk in taking over-the-counter medication, unlike older adults [8]. Most investigations found that young adults struggled to identify active ingredients and misinterpreted dosing specifications. For example, American adolescents had little knowledge about paracetamol, even though they had taken it. Meanwhile, Swedish youngsters believed that paracetamol is used for sedating anxiolytic and performance-enhancing characteristics. Additionally, nearly 70% of American high school students had no idea about whether ibuprofen and naproxen could be taken together or not. Interestingly, it was found that young adults whose parents were health

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professionals or pharmacists used less over-the-counter medication than others [8].

### **OTC Drug Use During Pregnancy: Risks and Considerations**

Alosaimi et al. (2022) stated that utilization of over-the-counter (OTC) medicines is common among the public and even pregnant women, and they use these drugs without the suggestion of a health professional. This could lead to dangerous outcomes for both the mother and the fetus during pregnancy. The unfavorable outcomes, dangers, and safety of OTC medications are stated by different studies. However, many studies specifically inspected the knowledge of pregnant women regarding the negative effects and benefits of over-the-counter medications. OTC medicines are easily accessible in marketplaces, due to which 90 percent of all pregnant women use them, regardless of the chances of harmful effects [9].

During pregnancy, women take self-medication for relief from ailments like shortness of breath, heartburn, headache, discomfort, nausea, and vomiting, which cause 10% of abnormal births worldwide [10]. In Europe, an international observation stated that 80 percent of pregnant women use medicines, whether prescribed or non-prescribed. During this period, the danger to the fetus from over-the-counter medicines created hurdles in parental care as well. During the pregnancy period, 36 percent of women use herbal cures, while 39% of them believe that a lack of knowledge about pregnancy cures could be dangerous for both the mother and child [11]. On the other hand, Hispanic women believed that the utilization of vitamins and herbs was even more secure than following prescribed treatments [12]. In most pregnancy-dealing clinics, awareness about the utilization of medicines during pregnancy is not spread, while nurses can play a good role here. They can instruct pregnant women regarding the danger of OTC medications. Different drugs have different outcomes on embryos during gestational age. Lack of visits to health specialists, time management, and high cost are the main factors that compel pregnant women to utilize OTC drugs.

### **OTC Medication Use Among Older Adults: Safety Concerns and Trends**

Stone et al. (2020) described that adults belonging to the age group of 65 years periodically use OTC drugs. Most of them use them daily or weekly. On

the other hand, without a prescription, OTC drugs pose a danger to health due to interlinking with other medications and medical conditions. Most of the adults do not know over-the-counter medicines. They trust that the OTC medicines are safe [13]. Albert et al. (2017) described that a good night's sleep becomes challenging for adults if they have chronic medical conditions that often correspond to sleep disturbances. Due to the outcome of this challenging scenario, adults resorted to OTC sleep aids that contained doxylamine or diphenhydramine. Moreover, these products are intended for short-term difficulty only, not for chronic use, and their well-being and effectiveness have not been well accepted in general and especially in older adults [14].

A study claimed that more than half of older adults who utilize OTC drugs do not use them securely. OTC-related unfavorable medicine events involving older adults are approximated in almost 100,000 hospitalizations each year [15]. Nevertheless, the health interest in OTC utilization could not be lessened due to its easy availability and time-saving benefit for the public. This type of healthcare should not be put off over the counter by older adults but rather lowered their unsuitable utilization and linked dangers. Current supervisory projects had also picked out secure over-the-counter hardness and related safe use, concluded by the Food and Drug Administration (FDA) organization of non-prescription safe use regulatory extension task force and state regulatory agency. Kim et al. (2018) stated that older adults play a vital role in purchasing OTC drugs, contributing 30% of the total. OTC medications are not all the time secure and favorable, and they could expose patients to unpredicted health dangers such as adverse drug reactions (ADRs) and drug-drug interactions (DDIs). The occurrence rate of ADRs and DDIs could be higher in patients who take non-prescription treatments [16].

### **Abuse of Over-the-Counter Medications: A Growing Public Health Issue**

Over-the-counter medicines can become an abuse when they are used for non-medicinal motives. For instance, to attain mind relief results, lose weight, or overcome skin issues. The misuse of over-the-counter medicines is defined as using these products for medicinal occasions but using them mistakenly, normally in terms of dosage or period of action. Sansgiry et al. (2016) described that self-care and

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self-medication are applications that are necessary for factors of any healthcare department. The utilization of OTC medications is a part of the self-medication operation. The favor of over-the-counter may have increased the abuse in patients. The medicines that are used often include sleep aids, antihistamines, caffeine, ephedrine, pseudoephedrine, antitussives, expectorants, dextromethorphan, laxatives, anabolic steroids, and sildenafil [17].

Laxatives are used for weight loss; high antihistamine doses are handed down for euphoria. From the studies conducted worldwide for OTC treatment abuse, drug-based combination items and cough and cold items that held dextromethorphan, sleep aids, antihistamines, analgesic hypnotics, and laxatives had been spotlighted as possessing abuse potential. Cough medicines and over-the-counter pain relievers are the most abused medicaments. OTC drugs or drug-accommodating products and OTC cough and cold medications are the most repeatedly involved medications for abuse. Codeine is the main medicine with abuse potential. Patients have uncomplicated and unbound access to looking for guidance from a pharmacist, including product selection, OTC label uncertainty, proper product utilization, and when to take medications. Therefore, a pharmacist emphasizes strongly OTC medications and product selection. Pharmacists are the very first step for anyone to be involved with over-the-counter medicines [18].

### **Common OTC Medications Prone to Misuse, Abuse, and Dependence**

Algarni et al. (2021) described that there is a prominent difference covering studies to determine the problem-making utilization of over-the-counter medicines, as some of them included every type of available OTC drug in the place of study. Some comprised one therapeutic category of medicines, while others concentrated only on a single OTC drug. Besides, hardly any study looked over the three stages of problem-creating use with an accepted clarification for each level. Therefore, the most described misused and abused OTC drug categories, going down in arrangement, were analgesics (with or without codeine), sedative antihistamines, cough mixtures having dextromethorphan, antidiarrheal agents (loperamide), decongestants, laxatives, and weight reduction agents (orlistat) [19].

### **The Risks of NSAID Abuse**

A study reported that non-steroidal anti-inflammatory medicines are among the most conventional medications globally and contain analgesic medication and anti-erythrocytic characteristics [20]. The international market width of NSAIDs is very high because of their success and security; many NSAIDs (ibuprofen, aspirin) can be purchased over the counter in various countries. Moreover, stronger dosages of some of these medicines, as well as other NSAIDs like diclofenac, mefenamic acid, and naproxen, are only accessible by prescription. The NSAIDs are declared to be secure if utilized within the provided instructions from healthcare professionals. Moreover, unsuitable utilization has also been reported. This unsuitable utilization could produce an outcome with a wide extent of danger, comprising gastrotoxicity, hepatotoxicity, and nephrotoxicity, and make health management more burdened. There is a requirement for magnified patient awareness, drug safety, and prescriber and pharmacist education regarding non- and extra-medical utilization of NSAIDs and their health mismanagement [21].

### **The Perils of Laxative Abuse**

Levinson et al. (2020) described those investigations brought to the surface that harmful dietary attitudes involving the utilization of diet drugs and negativity for weight control could push a person into danger of developing an eating disorder. The utilization of over-the-counter diet pills is not prescribed by a healthcare professional as a productive way to reduce weight. On the other hand, the dangers of utilization of these products for weight control persisted in trade statuses. According to an approximation, 15% of adults normally announce lifetime utilization of diet drugs for weight control. Although the utilization of diet drugs and laxatives for weight loss was common in people with eating mismanagement, the eventual coalition of the utilization of these products and succeeding discoveries with eating mismanagement was not known. Utilization of these products could have designated an embryonic eating disorder or the existence of a full, yet undiagnosed, eating mismanagement. Utilization of diet drugs for weight control could be harmful and might have been a cautionary signal that licenses advising and assessments for the existence of or the danger of growth in eating mismanagement [22].

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## Public Awareness and Knowledge of OTC Drug Use

Research conducted by Tariq et al. in 2017 examined the level of understanding among university students regarding the over-the-counter (OTC) medication paracetamol. The study revealed that a significant majority of participants, specifically 94.9%, acknowledged the insufficient knowledge about OTC medicines among the general public of Pakistan, including themselves. This conclusion was drawn based on the outcomes of a study instrument, which assessed participants' knowledge through a scoring system. The results indicated that 70.8% had poor knowledge, 18.8% had satisfactory knowledge, 8.0% had average knowledge, 1.4% had good knowledge, and only 1.1% exhibited excellent knowledge about OTC medicines [23].

According to a study conducted by Taybeh et al. in 2019, the knowledge of over-the-counter (OTC) medicines among the Jordanian population. The study found that a considerable portion of participants (68.5%), particularly those with higher education, possessed sufficient knowledge regarding OTC medicines. These participants also expressed the belief that antibiotics should only be obtained through a prescription and not dispensed without one. Furthermore, a majority of the participants agreed that nasal drops (51.7%) or eye drops (7.9%) should not be used if the medicine package had been opened for more than one month [24]. A study conducted by Bekele et al. in 2020, found that the mean knowledge score regarding the safety and effectiveness of over-the-counter medicines was 6.59, out of the respondents approximately 67.6% (257 individuals) demonstrated good knowledge in this regard [25]. Similarly, a study conducted in Saudi Arabia by Al Essa M et al. in 2019 yielded consistent findings. More than half of the respondents in that study were found to have good knowledge about self-medication using OTC medications [26].

In a study conducted by Faiqah Batrisyia et al. in 2022, it was found that the majority of respondents had a good level of knowledge regarding the use of over-the-counter medications. Specifically, more than half of respondents (77.7%) obtained a good knowledge score ranging from 7 to 9. In a similar study by Abdullah et al. in 2022, which assessed the knowledge, attitude, and practice of OTC medicine among students from public institutions of higher learning in Brunei Darussalam, no significant difference was observed in knowledge scores when comparing individuals with different characteristics.

However, in this study, a significant association was observed between knowledge of OTC medicines and academic degrees. It was reported that students enrolled in health science-related courses exhibited a higher percentage of good knowledge compared to students pursuing other courses [27].

The influence of education on self-medication is indeed significant, as evidenced in a study conducted by Parithar et al. in 2018 among 200 junior medical students in India. The findings of this study revealed that most medical students were more cautious and mindful about self-medication after acquiring knowledge about potential adverse drug reactions and drug resistance. This indicates that education plays a crucial role in shaping the attitudes and behaviors of individuals, even among medical students, toward self-medication practices [28]. According to a study conducted among 170 medical and pharmacy students at the Zabol University of Medical Sciences in Iran, it was found that self-medication using over-the-counter (OTC) medicines is more prevalent among students compared to the general population. This could be attributed to their higher levels of knowledge and better access to information through the Internet. The study suggests that the practice of self-medication among students may be influenced by their self-confidence and the knowledge they have acquired about medications [29]. Furthermore, having a good level of knowledge regarding self-medication with OTC medicines and understanding how to properly utilize these medications can contribute to improving one's health and potentially reduce the economic burden on the government.

Moreover, adults in Brunei Darussalam demonstrated a commendable level of awareness and favorable attitudes toward the utilization of over-the-counter (OTC) medicines. However, there are some concerning habits and practices, notably exceeding the recommended dosage and neglecting to read the medication's label and packaging. It is worth noting that only a minority were observed engaging in such improper practices. To restrict these behaviors, it is crucial to enhance awareness and knowledge among adults about the appropriate use of OTC medicines. This will contribute significantly to preventing improper practices in the use of OTC medications [30]. Salih et al., 2019 conducted a study on female students at Jazan University examining their knowledge related to over-the-counter (OTC) oral analgesics. The study revealed that students with a higher level of

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knowledge regarding the side effects and toxicity of OTC analgesics tended to use these medications less frequently, with only 12.1% of them resorting to ibuprofen or paracetamol [31]. Similarly, another study conducted by Boyles et al. 2019 found that respondents with higher levels of education demonstrated better knowledge scores concerning the appropriate use, potential daily dosage regimen, and side effects of antibiotics [32].

According to a study conducted by Chautrakarn et al. in 2021 on self-medication with over-the-counter medicines among the working-age population in metropolitan areas of Thailand, nearly all participants demonstrated adequate knowledge about basic medication. However, the research revealed that less than 80% of the participants correctly identified the accuracy of the following two statements: “When experiencing diarrhea, antibiotics should be administered immediately to prevent worsening symptoms” (78.1%), and “For bacterial infections, antibiotics should be taken for 5-7 days or as prescribed by the doctor, but in the case of viral infections, antibiotics should be discontinued immediately” (39.5%). These findings indicated that some or a majority of the participants had misconceptions about the appropriate use of antibiotics [33].

### **Factors Driving OTC Drug Usage**

A study showed that researchers have sorted out the reasons and risk components involved in misapply abuse and helplessness. Minor and persistent pain treatment is the main medical cause for single misapplying over-the-counter painkillers like paracetamol, Non-Steroidal Anti-Inflammatory Drugs (NSAIDs), and other mixtures of painkillers. Meanwhile, misuse of medicines for non-medical causes is more frequently utilized with drug-containing painkillers, dextromethorphan sedative antihistamines, and loperamide. Many people who have been dependent on frag-based pain relievers and loperamide allotted their helplessness to the delay of minor drug removal medications and in some cases, to endanger themselves or commit self-immolation. Dextromethorphan is abused by most of the public due to humeral motives, to perform self-immolation acts and gain a mind-change outcome. While calming antihistamines are ill-treated for increasing sleep and relaxation [34].

Other dangerous components compromised in over-the-counter medicines problem creating utilization together involved detectable societal

trade and health components. For example, trade components like individual issues, lonely living, childish practices of negative divorce practice, unemployment, self-respect, low level of literacy, and profession have corresponded to dextromethorphan abuse and codeine dependence. Low health status, damaged optical activity, long-standing disease requiring multi-drug therapy utilization, and advanced age are connected with increased risk of use of over-the-counter medicines among the elderly. Moreover, health acknowledgment, low literacy level, and misinterpretation of OTC medicines directions correspond to the occurrence of negative use in various groups including elderly people existing in developing and developed countries of the world.

### **Pharmacist role**

A study described that pharmacy always had a strong emphasis on the process of drug delivery. A more responsible attitude of pharmacists is required due to the increase in demand. Pharmacists are the very first source whom buyer’s approach. Pharmacists must have kept an eye on adult patients and also on patients most frequently requested for refills. Pharmacists could prevent the abuse of OTC medications by guiding patients through oral and written communication. It is also observed that many companies have taken actions to decrease drug usage among the population by refusing to sell over-the-counter medicines and not advertising medicines that can support drug addiction. Pharmacists must suggest patients abuse drug addiction. Pharmacists also must forward information about over-the-counter drug addiction to doctors immediately. Pharmacist support can play a vital role in the reduction of drug abuse. Their role can be more effective if these communication barriers are removed between doctors, pharmacists, and patients [35]

### **Consequences of OTC Medication Misuse: Side Effects and Health Risks**

Consumers frequently underestimate the potential risks associated with over-the-counter medications. Misusing specific drugs can result in substantial harm to patients. Furthermore, OTC medications can lead to severe harm and contribute to hospitalizations linked to adverse drug reactions (ADRs). For instance, a German study found that self-medication is responsible for approximately 4% of ADR-related hospitalizations in internal medicine

wards, with OTC medications being the cause in 53.8% of these cases. In a related study, researchers found that drug-related problems (DRPs) were reported in 0.6% of all over-the-counter (OTC) consumers. These DRP cases included instances of drug-drug interactions, specifically between OTC drugs and prescribed medications, which accounted for 13.0% of the documented DRP cases [36].

Similarly, another study found that among respondents who engaged in self-medication, 6.9% had encountered drug-related problems after using over-the-counter (OTC) drugs. Notably, ibuprofen was identified as the OTC drug most commonly associated with these issues, with gastric upset being the primary complaint [37]. In line with these findings, another study indicated that a small percentage of participants encountered adverse drug reactions when using medications, they bought independently, such as over-the-counter (OTC) drugs, with a range of 0.6% to 6.6%. The most common adverse drug reaction observed was gastric upset caused by non-steroidal anti-inflammatory drugs (NSAIDs) at 6.6%, while the least common was blurred vision at 0.6%. Most individuals who experienced adverse drug reactions described them as minor or moderate in severity. However, severe symptoms that required a pause in medication or medical treatment were reported by those who experienced nausea/vomiting, itching/rash, gastric upset caused by NSAIDs, shortness of breath, palpitation, dizziness, diarrhea, blurred vision, and steroid or topical steroid addiction caused by topical steroids, at rates of 9.1%, 7.9%, 19.6%, 25.0%, 5.1%, 20.7%, 13.0%, 50.0%, and 14.3%, respectively. Additionally, there are reports of severe reactions that necessitate hospitalization among individuals who experienced itching/rash, palpitations, and gastric upset caused by NSAIDs, with rates of 7.1%, 5.1%, and 2.2%, respectively [38].

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## Conclusion and Recommendations

Over-the-counter medicines might not have proved to be deadly, but their use in excess by the general public should be reduced, and doctors should be consulted before the use of any medicine. The government should organize campaigns to raise awareness about the use and negative effects of OTC medications. The cost of consulting a physician should be lowered for people who cannot afford to consult a doctor so that they do not take anything bad for their health. People should also stop recommending and taking recommendations from their friends and relatives when it comes to the use of medicines. Last but not least, people should become more open about discussing issues concerning urine and urine testing to prevent any complications in the future.

## Abbreviations

|        |                                       |
|--------|---------------------------------------|
| ADRs   | Adverse drug reactions                |
| DRPs   | Drug-related problems                 |
| FDA    | Food and Drug Administration          |
| NSAIDs | Non-steroidal anti-inflammatory drugs |
| OTC    | Over-the-counter                      |

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