Annals of Medicine and Surgery 78 (2022) 103797

Contents lists available at ScienceDirect

Annals of Medicine and Surgery

journal homepage: www.elsevier.com/locate/amsu

Short Communication

Over the counter drugs and self-medication: A worldwide paranoia and a troublesome situation in India during the COVID-19 pandemic

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ARTICLE INFO

Keywords:
Self-medication
Over-the-counter drugs
COVID-19
India
Public health

ABSTRACT

Self-medication is the use of drugs to treat self-diagnosed ailments without the use of a formal prescription. Self-medication is defined by the World Health Organization as the use of medications to address self-diagnosed diseases or symptoms. Over-the-counter (OTC) pharmaceuticals are medications that can be sold without a prescription directly to the client in accordance with the laws of each nation. During the COVID-19 pandemic, an increasing tendency in the use of OTC and self-medication was seen, with the situation in India particularly deteriorating due to lax regulatory restrictions. This has resulted in a slew of problems, ranging from a lack of drugs to severe responses due to overdosage and drug-drug combinations. There is an urgent need for more tangible regulatory control over self-medication and OTC medications to safeguard the uninformed populace from harm.

1. Introduction

Self-medication is the intake of medication the self-diagnosed symptoms without any valid prescription. The World Health Organization (WHO) has defined self-medication as the use of drugs to treat self-diagnosed disorders or symptoms, or the intermittent or continued use of prescribed drugs for chronic or recurrent disease or symptoms even after the duration prescribed is finished [1]. The prevalence of self-medication varies from 8.3% to 93% among the population of India [2]. There are plenty of reasons for self-medication like overconfidence in the knowledge of drugs, illiteracy, advertisements in newspapers and media, peer pressure, and advice from friends and relatives [3]. But the most important reason is poverty and easy access to medication through illegal pharmacies. Also, the absence of any concrete laws that oversee drug distribution or the failure to implement existing laws gives free hand to pharmacies. As low-income families cannot afford health services, the prevalence of self-medication is higher among them [4]. The drugs used for self-medication are mostly over-the-counter (OTC) drugs i.e., they are legally available without a prescription. The most common OTC drugs used during the COVID-19 pandemic were antipyretics (acetaminophen, ibuprofen), antihistamines (cetirizine, loratadine), cough suppressant (dextromethorphan), Vitamins B, C, D, Zic, etc [5]. However more dangerous drugs like steroids, chloroquine and antimicrobials were also abused. The prevalence of self-medication during the COVID-19 pandemic in lower-income countries like Nigeria, Bangladesh, Peru, and Togo varies from 34% to 84% for various symptoms like fever, cough, cold, nasal congestion, fatigue, etc. which is considered very high [6]. The developed countries have very few OTC drugs available for sale because of strict rules, easy and free basic healthcare for everyone, and control of the government over the sale of drugs. Despite this the sale of OTC drugs has not been stopped in developed countries like Sweden where the two-third increase was seen

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https://doi.org/10.1016/j.amsu.2022.103797
Received 4 May 2022; Accepted 11 May 2022
Available online 26 May 2022

in the sale of OTC drugs during the COVID-19 pandemic [7]. The main reasons for this were stockpiling of medicines due to fear of lockdown, a strong desire to treat the symptoms of minor ailments themselves to avoid getting exposed to COVID-19 by visiting a hospital and using OTC drugs for prophylaxis against COVID-19 infection. The article highlights the patterns of self-medication and OTC drugs among the population of India and also from a global perspective.

2. OTC drugs overview

OTC drugs are medicines that can be sold without a prescription straight to the customer in accordance with each country's individual rules. OTC drugs have traditionally been sold by pharmacies for extremely mild symptoms like myalgia, seasonal allergies etc which are not severe enough to visit the doctor. The rule of thumb here is to not delay going to the doctor if these OTC drugs do not relieve symptoms in a day or two. However, poor drug control regulations in many developing countries and even some developed countries have led to availability of many harmful drugs as OTC drugs which should ideally not be in the reach of the general population without a 'firewall' in the form of a doctor's prescription. In the context of the COVID-19 pandemic, OTC medications can be used as symptomatic therapy for mild COVID-19 cases without requiring the patient to visit a hospital. It is vital to note that hospitals are frequently overcrowded as a result of the current COVID-19 outbreak. As a result, individuals with moderate coronavirus symptoms can be treated at home. However, the source of worry is that even seemingly safe OTC pharmaceuticals like Tylenol, when used in excess dosages, can be hazardous, as witnessed during the COVID-19 epidemic, when panicked individuals self-medicate with analgesics, antipyretics, and other medications as a preventative precaution. Ibuprofen is the most often used OTC NSAID and contains anti-fever and anti-pain characteristics. However, in the context of the COVID-19 pandemic, it should be emphasised that the use of ibuprofen has been controversial due to remarks made in France claiming that ibuprofen might exacerbate the clinical status in COVID-19 patients [8]. As a result, there is evidence to support the notion that OTC medications were dangerous during COVID-19. The hoarding of other essential drugs like antibacterial, chloroquine and ivermectin creates a shortage of these drugs for people who rely on them for chronic autoimmune diseases or for people who get infected with other infectious agents rather than the SARS-CoV-2 [9]. The most rampant self-prescribed medicines are analgesics, antidiarrheals, antipyretics, antitussives, supplements like calcium and vitamins, anabolic steroids, sedatives, antibiotics, indigenous herbal remedies and homeopathic remedies [10].

3. Risks of self-medication

WHO mentions the following risks of over the counter medication in their guidelines [1].

- Self-medication has many risks. Consumers and pharmacy owners have no knowledge of pharmacology or of the significance of dosing and drug usage.
- Self-medication begins from self-diagnosis which has a high probability of being incorrect.
- Even correctly diagnosing oneself can be followed by incorrect choice of therapy.
- The average consumer will not know if they fall into a special group with significant pharmacological side effects like pregnancy, immunocompromised, elderly etc.
- The layman will have no knowledge of drug contraindications, warnings and precautions which can lead to serious adverse drug reactions.
- There persists the risk of double medication (if a patient is already taking the same active substance under another name) or harmful drug interactions with concomitantly taken other drugs.
- There is also the risk of incorrect route/manner of drug administration e.g., intravenous instead of intramuscular.
- Self-dosing is a very important risk of self-medication along with usage of drugs for prolonged periods which creates the risk of dependency and drug abuse in the future.
- Shortage of drugs for people who actually need them for other diseases.

4. Global picture of self-medication during the COVID-19 pandemic

The shockwaves that started in China in December 2019 did not take long to reach the rest of the world. And just like thunder following lightning, the fear of the deadly disease and panic ensued. People started buying groceries and stockpiling essentials, and non-prescription medications were no exception. A study on Google Trends conducted by David Onchonga showed increased worldwide hits for the search queries, "self-care", and/or "self-medication" [11]. There are two reasons for this. Firstly, as more and more individuals became confined to their houses, the internet became the only source of information they could access. Secondly, when hospitals began to overflow with patients, people became fearful of coming to the hospital. Instead, they started looking for options which did not involve going to the hospital, vis-a-vis, looking for non-prescription medications and homemade self-remedies.

This was a global trend, showing that all COVID-19-affected nations encountered higher demand, and hence a scarcity, of self-prescription drugs. A large number of medications, many of which had no logical reason for their usage, were withdrawn from the market. Ivermectin, for example, was widely used as an over-the-counter drug in India, Pakistan, the United States, Brazil, Mexico, Argentina, Australia, Egypt, Iraq, and many other nations [10]. So much so, that the WHO had to issue a warning to the public against the use of such medications [1]. Another example of this is the use of traditional herbal remedies in China [12]. This included Lianhuaqingwen capsules and Jinhuaqinggan granules for the treatment of mild conditions, and Xuebijing injectables for the treatment of severe conditions. Use of herbal medications were also reported in Pakistan and Saudi Arabia. A similar path was taken throughout the world, with complaints coming in from a variety of nations about self-medication and haphazard use of non-prescription drugs. More reports came in from African, South American, and Southeast Asian nations, correlating with Lopéz and Dennis' prior research [13], which found significant association between self-medication practices and lower levels of education.

Talking about the countries in particular, Kenya reported a 36.2% increase compared to pre-COVID-19 era, in people taking medicine without a doctor's prescription [14]. Similar findings were observed in Peru, where most patients reported using acetaminophen, ibuprofen, or azithromycin for various symptoms [15]. Whereas, Thailand reported an astounding 88.2% prevalence of self-medication in its metropolitan areas, most commonly using NSAIDs and antibiotics [16]. A similar number (88.3%) was observed in Bangladesh, with most people using ivermectin, and even doxycycline without prescription [17]. So widespread was the scare among the masses that even countries like Sweden and Poland reported of people self-medicating themselves [7,18].

The major downside to a large number of people resorting to self-medicating themselves is the side effects of these medications. Chloroquine and hydroxychloroquine were used widely worldwide, in spite of lacking evidence [19]. The haphazard use of these drugs may lead to ventricular arrhythmias and hepatic failure. Other commonly used drugs like NSAIDs cause gastritis when used against medical advice. Even the Chinese herbal medications cause several adverse effects, and some may even cause renal failure and urothelial carcinoma [20].

5. OTC drug abuse in India during the COVID-19 pandemic

Self-medication is the process of choosing and using medications to

address self-diagnosed symptoms or ailments without seeing a doctor. This has been defined by the WHO and included in one of the significant concerns in both developing and developed countries as indicated by various studies, especially in the wake of COVID-19 [21,22]. In the wake of social media becoming more accessible than the healthcare itself, misinformation regarding medication, pathophysiology of the disease, treatment, and prevention has led to public confusion and panic [23]. It has been documented that along with an ongoing pandemic, there have been several small endemic diseases like mucormycosis, and an equally disturbing infodemic going on in the world [24–26].

India suffers from a unique situation as the healthcare forces in action includes a variety of philosophical, religious, and spiritual believers apart from the practitioners of scientific evidence-based medicine. These forces apart from believers of allopathy consist of AYUSH practitioners. In government terminology and in common parlance the acronym stands for Ayurveda, Yoga, Unani, Siddha and Homeopathy. They include institutionally qualified doctors who predominantly offer services in rural cities and townships constituting lakhs of village households, where unfortunately misinformation is rampant [27]. They have been authorized to recommend, comment and treat for the all diseases including COVID-19 which includes prescription rights since December 15, 2020.

The increased misinformation, lack of prescribing doctors with knowledge of disease pathology and latest evidence, and the added fear of an unknown diabolical disease, has increased self-medication and prescription during the pandemic. As suggested by Shet et al. the prevalence of obtaining drugs without prescription can be as high as 66% [28]. Choudhary et al. suggest this was as high as 48% during the pandemic [29]. India, as most of the developing countries, has no electronic health records established in majority of hospitals and clinics. This coupled with no laws supervising prescription or sale of OTC till date, underestimates its prevalence and consequences at an exponential scale [30].

Self-medication underestimates the prevalence and incidence of the disease. Especially in a pandemic where contact tracing and timely documentation of cases is necessary, it impacts institutional policies made to mitigate the diseases. Disease pathology like that of the COVID-19, requires careful monitoring of the symptoms at critical times like the 5th to 10th day, in order to prevent the cytokine storm [31]. Self-medication with incomplete knowledge of the disease pathology may counterintuitively increase the morbidity among those affected. Steroids as an OTC preparation or unsupervised prescription drug, may cause increased side effects like predisposition to fungi like mucormycosis [25,32,33]. Antibiotics which are self-administered but not taken for the entire time course, may cause the development of resistant bacterial strains [34]. Hence, OTC drug abuse in India was a big problem in India with grievous consequences, which has become an even greater problem accelerated by the COVID-19 pandemic.

6. Future recommendations

The trend of self-medication is significantly observed in both developed and developing countries. Prevalence of self-medication peaks at almost 80% worldwide and around 78.6% in India [10,35]. Amidst COVID-19, where there is a surge of online misinformation, it has contributed towards rising prevalence of self-medication and thereby associated risks. On the brighter side, regulatory changes brought in the OTC drug review process of Food and Drug Administration (FDA) through Coronavirus Aid, Relief, and Economic Security Act (CARES) are expected to set stricter processes in OTC drug approval and review, in the history of OTC [36].

In India, OTC regulations are weaker compared to other developed nations like US and Europe. As per existing regulations, any drug which does not come under prescription category (Schedule H, H_1 and X drugs) is generally labelled and marketed as OTC medicine [30]. A unified regulation to control the use and sale of OTC products is necessary to safeguard patient's safety.

OTC medicines fall under separate category of drugs and therefore have well-established regulatory measures and guideline in many of the countries. Indian system should focus on OTC drug delivery system to enable judicious delivery of OTC drugs measures need to be taken to make sure that rural population too has access to it. There is a need to recognise innovative COVID-19 strategies such as evidence-based drug assessment and standards; distant inpatient order review and distributing tele pharmaceutical care, telehealth counselling, and patient education; and interactive media health education to protect the public from the negative effects of OTC and self-medication. During these stressful situations, a patient–pharmacist contact might aid patients in their decision-making process. People must be made aware of all of the drug's side effects so that the consumer may make an informed decision that is not influenced by ignorance and paranoia.

WHO recommends the following assessment criteria for the applications submitted for marketing authorization of OTC medications [1].

- Prior to marketing authorization of the proposed OTC drug, significant clinical experience data on the indication and usage of the new active substance must be obtained
- Switching prescription-only drug to OTC mandates the requirement of original regulatory data, clinical trial data after drug approval, drug utilization and evaluation report, treatment related adverse events or interactions and all recent scientific data reports
- Re-assessing the existing OTC requires reviewing the drug rationality, risk-benefit ration analysis as well emergency handling measures

7. Conclusion

Self-medication and over-the-counter medications have become crucial components of healthcare, but their availability is a serious worldwide problem, particularly during the COVID-19 epidemic. Inappropriate self-medication and the use of OTC drugs might result in an inaccurate diagnosis, major side effects, drug interactions, drug dependence, and germ resistance. As a result, there is an urgent need to monitor and manage acceptable self-medication and OTC drug practises through the use of strong laws and the involvement of healthcare experts and policymakers.

Ethics statement

The present study includes printed and published information; therefore, the formal ethical clearance was not applicable for this study.

Source of funding

None.

Author contribution

MMH, MB: conceived the idea, designed the study and drafted the manuscript. IR, MB, AMS, EK, SP, IJ: conducted literature search and created the illustrations. PKB, RS, SS, MMH: revised the manuscript critically and refined the illustrations. MMH, MB, SS, MYE, and IR: revised the final version of the manuscript critically and gave the final approval.

Trail registry number

None.

Grantor

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Declaration of competing interest

The authors declare that there is no conflict of interests.

Acknowledgments

Not applicable.

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