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REVIEW ARTICLE

PREVALENCE, PRACTICES AND SAFETY RISKS OF OVER-THE-COUNTER MEDICATION USE IN OLDER ADULTS: INSIGHTS ON MISUSE AND THE CRITICAL ROLE OF PHARMACISTS

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Self-medication with over-the-counter (OTC) products is a common but risky practice among older adults. It's driven by convenience, but age-related changes, multiple health issues, and taking several medications complicate the situation significantly. This mixed-method review synthesizes evidence from quantitative and qualitative studies including surveys, observational studies, systematic reviews, and qualitative research, to evaluate the prevalence, practices, and safety risks associated with OTC medication use among older adults in places like the US, Europe, and Asia. The findings show a wide range of self-medication rates in this group, from 4% to 87%. Analgesics are the most commonly used drugs. Factors that influence this behavior include financial issues, past positive experiences, easy access, and the desire to handle minor health problems on their own. However, significant risks exist. For example, one study in the US showed that 82% of participants self-recommended treatments. According to a different survey, 41% of consumers abused OTC products, including improper usage leading to potential drug-drug interaction, drug-disease interaction, drug-age interactions, and use beyond recommended labelling instruction. Pharmacists are often the main source of information for these individuals. This study concludes that focused consumer education and integrated care between pharmacists and doctors are essential. Providing these professionals with specific training to oversee OTC use is vital to reducing drug-related risks and fostering safer self-medication practices among older adults.

Key words: OTC, Community pharmacy, Patient safety, Older adults, Self-medication.

INTRODUCTION

Drugs that can be bought from a pharmacy without a doctor's prescription are known as OTC medications [1]. OTC medications give people an easy way to deal with common health problems and get rid of bothersome symptoms without having to pay for medical care self-medication is widespread among consumers worldwide [1,2]. It is defined as the use of OTC medications to treat self-identified disorders or symptoms, or the intermittent or continuous use of previously prescribed medications for chronic or recurrent diseases or symptoms [3,4].

A significant portion of OTC consumers are older adults [2,5,6]. Even though they make up only 13% of the US population, 30% of OTC medications are used by older adults [6]. The reported prevalence of self-medication among the elderly varies greatly among populations, ranging from 4% to 87%, with most studies reporting values between 20% and 60% [7]. For example, high prevalence rates of self-

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medication have been documented in a number of places, such as 72% among the elderly in rural Egyptian villages [8] and 85.4% among adult consumers in Ibadan, Southwestern Nigeria [4].

OTC self-medication is convenient, but compared to other age groups, older people are more likely to have medication-related issues [2,9]. Age-related physiological changes multimorbidity, and polypharmacy are the causes of this vulnerability [2,3]. Consuming OTC product raises the risk of adverse drug reaction (ADRs) and poor health outcomes, especially in older adults with comorbidities [3,4]. The concurrent use of prescription and OTC medication puts up to 50% of the 2.2 million older adults at risk for a major adverse drug event (ADE) [10].

Given the high prevalence of self-medication, improper use, and related side effects [2], research investigates the traits of OTC users, including their beliefs, preferences, behaviors, and decision-making processes [2,9]. Identifying tactics and interventions, particularly involving pharmacists, to promote the responsible and safe use of OTC drugs in this susceptible population is a major objective of numerous studies [1,2,11]

This study was a mixed-method review that combined finding from various types of evidence, including quantitative studies that examined patient behaviors, decision-making patterns, and pharmacist perspectives. The researchers chose the mixed-method approach to gain a full understanding of OTC medication use among older adults. They aimed to merge prevalence data, medication use patterns, associated risks and contextual factors that affect self-medication practices.

Methodology

This mixed-method review looked at studies that analyzed OTC medication use and self-medication practices in older adults. It included data from surveys, observational studies, interviews, focus groups, systematic reviews, and intervention studies. The review combined findings from these different sources to identify how common OTC use is, the pattern of use, reasons for self-medication, medication-related risks, and the role of pharmacists in encouraging safe OTC practices.

Survey and observational studies

US survey study

A convenience sample of 88 residents aged 65 and older from two independent living communities in central Virginia took part in a survey. Research used a 51-item semi-structured questionnaire, which they administered in person from April to June 2017. The study aimed to measure prevalence, attitudes, perceptions, preferences, and practices related to OTC use [2].

Indian community pharmacy study

This was a prospective observational study conducted in a private community pharmacy in Mysuru city, India, over eight months. Researchers collected data from 434 subjects who bought medications for chronic conditions without a prescription [1].

Egyptian rural village study

A descriptive exploratory design was used with a convenience sample of 100 elderly individuals from five rural villages in Fayoum governorate, Egypt. We collected data through a structured interview questionaries and a 3-point Likert scale to assess self-medication practices, reasons, types, and attitudes [8].

Slovakian community pharmacy study

A questionary with 54 items via 25 community pharmacies was distributed to patients aged 65 and older who were purchasing OTC medication. Five hundred and nineteen questionaries were included in the statistical analysis [12].

US rural community (MoVIES project)

This was cross-sectional study of an age-stratified random community sample of 1,059 older individuals, with a mean age of 74.5 years, in the mild-Monongahela Valley, Pennsylvania. The study relied on self-reported OTC medication uses [5].

PIM and misuse assessment studies

Chinese beers criteria study

This study used the Beers Criteria 2019 PIM list to identify potentially inappropriate active ingredients in Chinese OTC drugs. The methodology involved searching for drugs registered on The National Medical Products Administration of China website and cross-referencing them with the Chinese OTC selection and conversion catalog database [13].

US misuse rate examination

A preliminary study included interviews with 20 older adults to explore their choices of OTC pain and sleep medications. It categorized misuse into four types: drug-drug interaction, drug-disease

interaction, drug-age interaction, and usage that exceed product labelling [6].

US intervention protocol
A study protocol was outlined for a hybrid effectiveness-implementation design (Type 2) intervention aim to prevent misuse of high-risk OTC medications through redesigning physical aisles and using a clinical decision tool in mass-merchandise stores [10].

Qualitative and systematic review methods
US pharmacist mental model study
Three focus groups were conducted with 21 community pharmacists in Wisconsin. A vignette scenario helped reveal the pharmacist's thinking when they counselled older adults about OTC sleep aids [11].

US older adult decision-making study
Situational interviews were held using a scenario-based method with 87 older adult participants in three community pharmacies. This assessed their intended use of selected OTC medications [9] (**Figure 1**).

RESULTS AND DISCUSSION

Prevalence and demographics

Self-medication is common among older adults. The prevalence of self-medication among seniors who live in community varies greatly around the globe, from 4% to 87%, with most research indicating rates between 20% and 60% [7]. This large range could be explained by variations in study methodology, cultural practices, geographical location, healthcare accessibility, and the concept of self-medication utilized in different studies. Differences in stated prevalence rates may also be caused by variations in participant characteristics, such as age distribution, gender, socioeconomic position, and living conditions. According to self-recommendation, 82% of respondents in a study of senior living facilities in central Virgina said they used OTC drugs [2]. Similarly, significant rates of self-medication among older persons were seen in rural Egypt (72%) and Nigeria (85.4%) [4,8].

In several studies, women were more common among participants and were more likely than men to use any OTC drug. They reported taking significantly more OTC drugs [5,12]. In a US rural sample, participants with more education took significantly more OTCs [5]. However, in Egyptian rural elderly, researchers found a significant correlation between self-medication practice and a lower level of education [8].

Reasons for self-medication and decision-making practices

The decision to self-medicate comes from several factors, such as the perceived safety and effectiveness of OTC medications, along with economic or convenience concerns. Most older adults in the US, about 80%, view OTC medications as safe and effective. In Slovakia, 75.5% of people believe OTC medications are safe or mostly safe [2].

Primary reasons reported for self-medication
People self-medicate for various reasons, including convenience, how serious they think their illness is, past experiences, and financial factors such as if I have minor issue, I can handle it myself (90.9% of consumers in Nigeria) [4]; It's easy to get to the pharmacy (88.9% in Nigeria) [4]; Going to a hospital takes too much time (75.5% in Nigeria) or waiting long at the doctor's office is a problem (Slovakia) [12]; Money issues (55% in rural Egypt) [8]; Having treated a similar problem before (44% in rural Egypt) [8].

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Information sources and purchase location
The most common place to buy OTC medication in the US was the pharmacy, with 93% [2] of people reporting it. In the Egyptian rural study, 100% of elderly respondents said they purchased medications at the pharmacy [8].

The main source of information varies, but pharmacists consistently play a significant role

Physicians were most frequently mentioned sources for OTC medications (90%) in a US senior living study [2]. Pharmacist and

pharmacy staff were reported as main source of information in many studies, including rural Egypt (55%) [8] and rural India (72.6%) [3]. They were also the most consulted sources in Slovakia [12]. In a US study of older adults, more than half said they would seek help from pharmacists with OTC medications information.

Misuse and risk assessment

The high rate of self-medication often leads to a lot of inappropriate use. A US survey found that 41% of older adults misused medications [2]. A preliminary study on high-risk situations revealed that 95% of older adult participants had at least one instance of possible misuse [6].

Types of potential misuse observed (n=20 participants, US study)

The study identified four potential types of misuse viz. drug-drug interaction, drug-age interaction, and usage beyond product labelling recommendations [6].

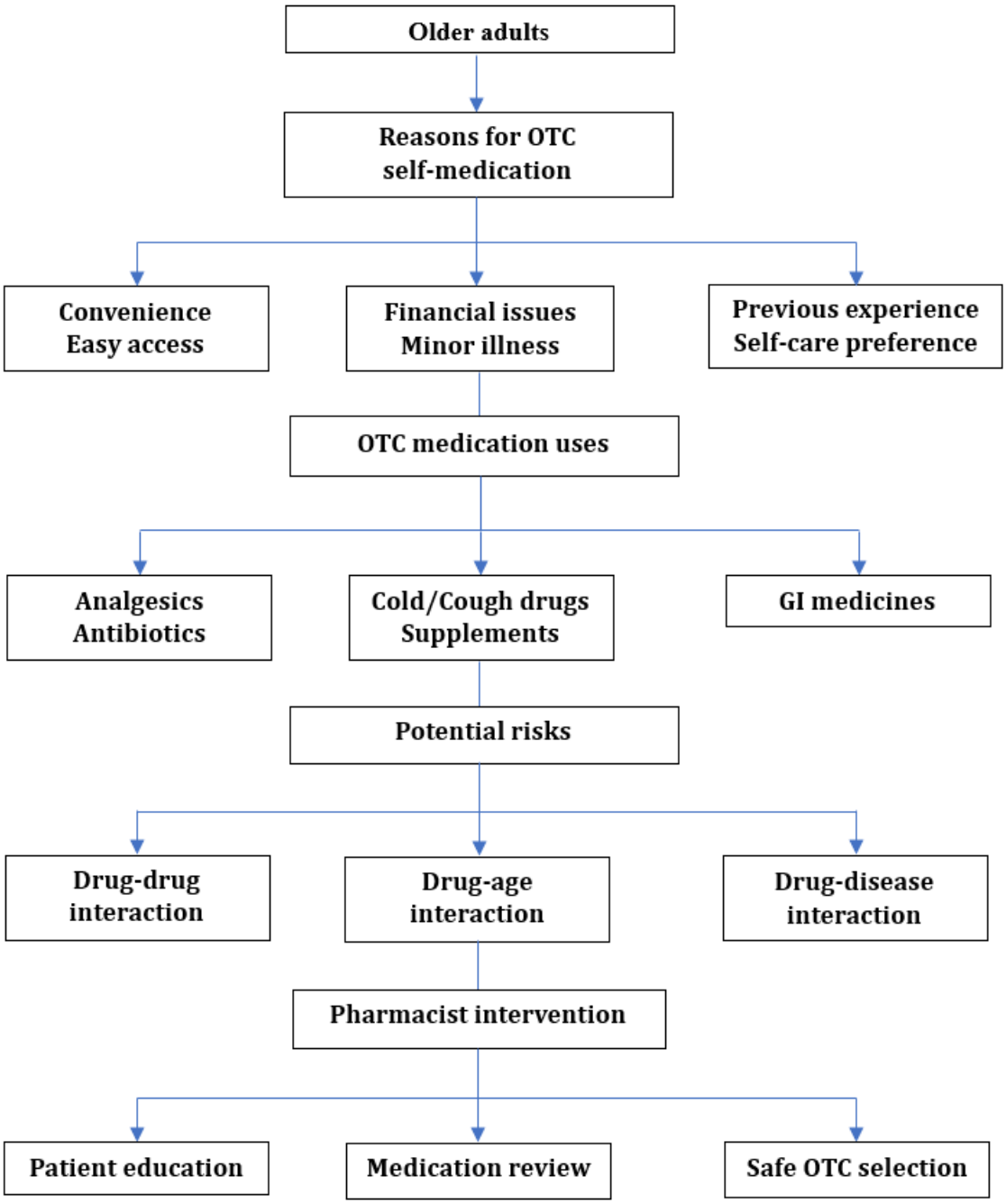


Fig. 1. Conceptual framework illustrating factors influencing OTC medication use among older adults, associated medication-related risks, and the role of pharmacists in promoting safe self-medication practices

Drug-drug interactions
80% of participants chose an OTC that could lead to a drug-drug interaction with their current prescription medications. On average, there were 3.9 interactions per participant [6].

Drug-age (beers criteria) and drug-disease interactions
60% and 45% of participants were at risk for drug-age or drug-disease interactions [6]. For sleep medications, drug-age interactions were very common. They affected 65% of participants, mainly because most sleep OTCs contain diphenhydramine or doxylamine. These are listed on the Beers Criteria as unsafe for older adults [6].

Usage misuse
Only a small percentage (15%) of participants said they would use the selected drug outside the recommended guidelines [6].

Risky practices
In Nigeria, over 95% of consumers practicing self-medication engaged in risky behaviors. This included failing to check expiry dates, ignoring label instructions, or taking expired drugs [4].

Commonly used OTC categories
Analgesics are often reported as the most used OTC therapeutic category in various studies (**Table 1 & 2**). They are typically followed by vitamins and supplements, as well as medications for cold, cough, or gastrointestinal issues [2,7,13].

The crucial role of pharmacists
Given the complexities of interactions and the high potential for misuse, community pharmacists have important role in protecting older adults. In pharmacist consulting model, pharmacists use a clear method when counselling older adults on OTC use. Their approach includes gathering information focused on four main goals viz. ensuring appropriate indication: Asking about symptoms, when they started, and their severity; identifying safety concerns: checking the patient's medication list, looking at existing chronic conditions, and reviewing past treatment history; establishing shared goals: finding out what the patient has already tried; providing recommendations: often suggesting changes in behavior first, like improving sleep habits, then recommending an appropriate OTC medication.

Table 1. Most prevalent OTC therapeutic categories used by older adults

Therapeutic Category	Location/Context	Prevalence (%) / Specific Findings
Analgesics	US senior living residents	76% was the most common therapeutic category. Aspirin was the most common specific drug at 65% [2]
Analgesics/Antipyretics/ Anti-inflammatory Agents (A/A/A)	US rural (MoVIES)	66.3% overall [5]
	Mysuru city, India (Chronic disorders)	Analgesics, such as Aceclofenac and Paracetamol, were bought by 74 participants, which is 17.05% [1]
Cold Medications	Chinese PIM study	Accounted for 47.9% of OTCs containing Pim active ingredients [13]
	Rural Egypt elderly	Used by 48% of older adults, cold symptoms occurred in 76% of cases, and cough symptoms appeared in 40% of cases [8]
Antibiotics	Mysuru city, India (Chronic disorders)	Most commonly purchased medication, 45.62% (198 subjects), often included Azithromycin [1]
	Rural Egypt elderly	Most frequently consumed medication (63%) [8]
Vitamins/Minerals/Supplements	US rural (MoVIES)	38.1% of participants [5]
Gastrointestinal (GI) Medications	Mysuru city, India (Chronic disorders)	Purchased by 56 subjects (12.90%) [1]
	US rural (MoVIES)	Antacids were used by 27.9%. Laxatives were used by 9.7%. The use of laxatives increased significantly with age (P< .001) [5]

Table 2. Most frequently selected specific OTC medications (US scenario study, n=20 participants)

Medication type	Specific location	Number of times selected	Potential misuse rate (Participants)
Pain	Ibuprofen 200 mg	7	Drug-Drug interaction: 60% [6]
	Naproxen 220 mg	5	Drug-Disease/ Age interactions: 30%/ 0% [6]
	Acetaminophen (various doses/forms)	5 [6]	Drug–Drug interaction/Drug–Disease Interaction/Drug–Age Interaction /Excess usage 60%/30%/0%/15% [6]
Sleep	Diphenhydramine 25 mg	9	Drug-Drug interaction: 50% [6]
	APAP/ Doxylamine/Dextromethorphan	4	Drug-Age interaction: 65% [6]

When selecting OTC sleep aids for older adults, pharmacists stressed avoiding anticholinergic antihistamines due to side effects such as dizziness or issues with incontinence or glaucoma [11]. The preference for getting OTC information from pharmacists is linked to a better perception of the safety of OTC medications among elderly patients [12]. This supports the idea that pharmacy-based interventions can help older adults choose and use OTC products safely [2].

CONCLUSION

Research continuously shows that OTC medication self-medication is a very common health practice among older adults globally. However, studies show a high percentage of self-reported in appropriate use and documented instances of potential misuse, especially due to drug-drug and drug-age interactions, so there are serious risks associated with this convenience. Customers' widespread belief that OTC products are always safe, regardless of usage or pre-existing medical conditions, increases this risk.

Developing consumer education and strengthening the bond between pharmacists and older adults to promote responsible OTC use should be given top priority in order to reduce medication-related issues. The responsible use of OTC medications by the elderly must be actively supervised and guided by medical professionals, particularly community pharmacists.

In order to maximize pharmacist-patient communication and guarantee that safe medication choices are made, future research should concentrate on improving and putting into practice system redesign interventions, such as physical layout changes and clinical decision tools for pharmacists. To generalize results and guide policy initiatives, these findings must also be replicated on a larger, national scale.

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