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Determinants and patterns of self-medication: A comprehensive literature review

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Abstract

Background- Self-medication is a major public health concern practiced worldwide. Research indicates that improper self-medication leads to adverse drug reactions, masks underlying diseases, results in incorrect diagnoses, escalates morbidity, contributes to drug interactions, fosters antibiotic resistance, and strains resources within the healthcare system.

Many studies on self-treatment have been published for certain countries or diseases, in addition to specific demographics, including teenagers, senior citizens, and medical pupils. The issue of self-treatment and related antibiotic resistance poses a serious threat to global public health, as there has been a reported rise in self-medication practices over the past ten years. To obtain a thorough yet equivalent awareness of related issues and to make more definitive and practical conclusions for future action planning than those derived from reviews on the topic, it may be beneficial to integrate the current global self-medication data. Therefore, we set out to undertake a study to fully understand the prevalence, sample demographics, medications consumed, target ailment, and reasons for self-medication.

Methods-Using the terms "self-medication, “Factors associated with it," and "non-prescription," a systematic review of the literature on self-medication practices was conducted using the databases PubMed, Medline, and Web of Science. The search was limited to cross-sectional study articles published between 2018 and 2022.

Results- This analysis comprised 23 studies comprising 8,445 individuals in total. Headache, pain, and fever were shown to be among the most prevalent indications for self-treatment, followed by cold and cough. A summary of 20 studies inferred that Analgesics, antipyretics, and NSAIDs were the most self-practiced medications.

Conclusion- Self-medication is widely practiced worldwide. It is critical to control and oversee appropriate self-medication practices through the enactment of strict laws and the involvement of legislators and medical experts. Large-scale public health awareness efforts on a variety of platforms, efficient medication distribution regulation, and legal proceedings against medical malpractice should all receive a great deal of attention. More cross-sectional studies employing a standard methodological framework are needed to have a deeper understanding of the incidence and practices of self-medication worldwide.

Keywords: Self-medication; Over-the-counter drugs; Prescription; Prevalence; Analgesics

1. Introduction

Self-care among people has increased due to rising interest in personal wellness and simpler and quicker access to information. They wish to take charge of their health, especially right now after the COVID-19 pandemic situation. Self-care, as defined by the World Health Organization, is what individuals do for themselves to achieve and preserve health as well as to prevent and treat illness, whether or not they receive medical assistance.[1].

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More people than ever before are using over-the-counter (OTC) non-prescription drugs to treat common ailments like fever, indigestion, coughs and colds, and aches and pains. Today, OTC drugs account for the majority of all medications taken globally, including those that were previously exclusively available with a prescription. At first, OTC remedies included relatively few drugs. [2].

The World Health Organization defines self-medication as taking drugs to treat ailments that one diagnoses and, in certain situations, signs of persistent or recurring ailments that a physician has prescribed [3]. On the other hand, discordant self-medication refers to the careless use of medication [4]. Using prescription drugs that are out-of-date, prescribed for unrelated symptoms or diseases, used without a prescription, shared among friends and family, and expired prescriptions are all examples of this type of self-medication. [5].

The risks associated with incongruous self-medication include dependence risk, side effects from inappropriate medicine, misdiagnosis, delaying expert counsel, poor therapy selection, taking pharmaceuticals with unanticipated side effects, and taking the wrong doses of medications [7]. Self-medication is a frequent practice throughout the world, with prevalence rates ranging from 32.5-81.5%, per various research [8]. False information about self-medication spreading on social media has also made the issue worse by spreading anxiety and confusion and encouraging the use of home remedies that aren't proven to be secure or efficient. [9].

Unintended consequences may include adverse events, unnecessary expenditures, unwillingness to seek professional assistance, drug interactions, and symptom masking, according to the World Health Organization (WHO) [25–27]. Demographic factors [4,5,28], measurement techniques [5], and variations in geographic locations and social conditions [29–31] all have an impact on how common self-medication is.

2. Approach to literature review search

The Medical Literature Analysis, Retrieval System Online (MEDLINE) database, ISI Web of Science, SCOPUS, UGC CARE, journals like Pharmaceutical journals, and a World Wide Web search (Search engine: Google) were consulted to conduct an unbiased review and analysis of all pertinent research and cross-sectional studies that assessed the frequency of self-medication behaviors within the general population. The primary finding of this study was the extent to which self-medication is practiced worldwide. Secondary outcomes included sources that included information on self-medication habits, socioeconomic traits, indications, the types of medications used, and the justifications for using OTC drugs.

OTC medications are widely used, although opinions about them and people's understanding might differ substantially. This review aims to investigate current perceptions and understanding of over-the-counter medications. This study aimed to ascertain the overall frequency of self-medication behaviors and the influencing factors

2.1. Eligibility requirements

The following studies were included in the analysis:

- Cross-sectional research that is openly available in the full manuscript, including preprints, or that has been presented in academic journals
- The usage of self-medication by the general public, regardless of location or age
- Released in the years 2018–2022.

Preprints were included to restrict the possibility of bias arising from research design by exclusively searching for cross-sectional studies and to assure accountability, wider coverage, and visibility of the unpublished data. Moreover, among other things, editorials, assessments of literature, symposium descriptions, case studies, and series were not allowed.

2.2. Data extraction

Originally, data for the research was exported to the version of the MENDELEY reference management tool from electronic databases. Subsequently, duplicate articles were eliminated using MENDELEY, and manual removal followed. The inclusion/exclusion criteria were applied to the title pages and abstracts of the papers. The final manuscripts were then obtained following a thorough full-text screening process. Either the information was calculated from the available data or it was pulled straight out of the article.

3. Results

3.1. Study characteristics

There were significant differences in the time frame, subjects, and sample size across the 23 investigations carried out in various nations across the globe. All of them concentrated on attitudes toward over-the-counter medications, knowledge, attitude use, and self-medication activities. Three studies among university students [10, 33, 37], one among school instructors [19], and six studies among undergraduate medical and pharmacy students [12, 14, 18,20, 24, 36] all tracked students' self-medication behaviors. Thirteen research looked at community members, including working age groups, older adults, patients from rural communities visiting hospitals, and teenagers[15,16,17]. With sample sizes ranging from 88 to 1089, cross-sectional sampling was used in all investigations, which were carried out across 13 different nations. There were two (2018), three (2019), seven (2020), six (2021), and five (2022) investigations conducted.

3.2. Data summary of included studies

Just 35 papers out of 75 non-duplicate articles qualified for full-text evaluation. Finally, our analysis encompassed a total of 23 trials with participants. The cross-sectional design of all the included studies ranged from one day to three months for their study duration.

3.3. Prevalence of self-medication practices

Globally speaking, self-medication is quite common in terms of prevalence. Its high prevalence rate, which falls between 32.5 and 81.5%, is noteworthy. Concerningly, 92% of people in poor nations use self-medication; in contrast, 68% of people in European nations do the same, and 31% and 59%, respectively, in nations like India and Nepal. Over 70% of the population reported using self-medication, according to the 23 research conducted. Surprisingly, a higher than 90% prevalence of self-medication among medical students was observed.

3.4. Sources of information on medication

Fifty percent of the respondents had a high level of comprehension regarding the use of over-the-counter drugs. The vast majority of participants reported a positive view of over-the-counter medicine use. The majority of respondents said that using over-the-counter (OTC) drugs for self-medication is safe when done correctly and that obtaining and using them is simple. Medical students are self-treated for mild illnesses [24][12][36][14][20][18]. The second most common justification for self-medication, behind cost-effectiveness [17] and educational opportunities, was time savings. Few people had utilized leftover prescriptions from previously given medications [36], with the majority having obtained the medication from a pharmacy [16], acquaintances, or relatives coming in second. Most students got their information about the medications via media marketing, textbooks, peer groups or family members, pharmacists, and previous prescriptions.

3.5. Reasons for self-medication

23 research looked at reasons for using over-the-counter drugs. These are linked to issues with the healthcare system, like long wait times, remote access to medical facilities, and a lack of workers in the sector. Patients may more easily obtain drugs from neighborhood businesses, street vendors, and pharmacies if they do not have a prescription. The study also highlighted the notion that over-the-counter drugs could be used to treat mild illnesses [38]. Additional considerations included the knowledge gained from previous treatments and the financial constraints resulting from paying consultation fees[38].

According to thirteen research that compiled data on OTC medication use, friends, family, and neighbors were the top sources of information mentioned by study participants. Other sources were the pharmacies where they bought their prescription drugs and drug information pamphlets. Additionally, information is available through advertisements and the media, including the Internet.

Health literacy is one of the major variables affecting attitudes and knowledge regarding over-the-counter medications. The term "health literacy" describes a person's capacity to comprehend and apply health information to make wise decisions. Higher health literacy skills have been linked to a better understanding of over-the-counter medications and more appropriate usage of them, according to studies[10,33,37].On the other hand, those with low health literacy may abuse over-the-counter medications more frequently and be more susceptible to side effects [17, 38].

Age is another crucial component. In addition to having a higher likelihood of routinely using OTC medications, older persons may also know less about them[23]. They might not be aware of any interactions with other prescriptions they are taking and could be less inclined to look out for information regarding over-the-counter drugs. Conversely, younger folks might be more prone to use over-the-counter medications recreationally and might not be as aware of the risks involved in doing so.

The accessibility of information regarding over-the-counter medications also influences attitudes and knowledge. People can now more easily obtain information regarding over-the-counter medications thanks to the Internet, but false information has also increased as a result of this. Online sources of information can differ widely in terms of quality, making it challenging for people to identify reliable sources. Furthermore, some people might not feel comfortable using the Internet to find health-related information and instead rely on unreliable sources like friends or family.

Studies that looked at the relationship between age and over-the-counter drug use generally revealed that people over 40 used these drugs more frequently than people younger. According to one study, OTC medicine use declined as participants' ages rose [35]. One study examined OTC drug use among persons 65 years of age and older [23]. Two studies show that women are more likely than men to use over-the-counter medications [13][38]. More women than men participated in nine of the research. According to one study, self-medication usage and family history are related [32].

When it comes to opinions regarding over-the-counter (OTC) drugs, the consensus is that since they can be purchased without a prescription, they are safer and produce fewer negative effects than prescription drugs. This isn't always the case, though. Over-the-counter (OTC) pharmaceuticals may not be suitable for everyone and can have major adverse effects and combinations with other medications. Before taking over-the-counter medications, people should be aware of the possible hazards involved and speak with a healthcare professional. Many studies examined the abuse of over-the-counter medications. Ten studies' worth of participants reported taking larger doses than recommended or suffering negative side effects[10,13,14,18,19,21,34,37,39, 40].

3.6. Indication of self-medication practices

This analysis comprised 8445 participants from 23 different trials. Out of all the indications, fever, headache, and pain[12,14,15,16,17,18,33,38] were shown to be the most easily recognized causes for self-medication, followed by cough and cold[38].

3.7. Type of medication

The most commonly self-practiced drugs were found to be analgesics [12,13,14,34], NSAIDs [12,18,20,23,32,33,35,36,37, 40], and antipyretics [17,18,20,23,34]. Vitamins were the most commonly self-practiced medication, according to a study conducted on teachers [19].

Table 1 Characteristics of included studies such as Author, year, country, sample size, and subject

Author	Year	Country	Sample size	Subject
Goyal et al.	2018	India	70	Rural Population
H. Shah et al	2018	India	200	Medical Students
Tesfamariam, S	2019	Eritrea	609	Pharmacy outlets
Elsayed	2019	Sudan	500	Patients attending ophthalmic hospital
Taklikar& Dobe	2019	India	900	Rural community
Bekele et al	2020	Ethiopia	380	Medical and pharmacy Students
Mathias et al	2020	India	220	Adolescent
Ettebong& Bassi	2020	Nigeria	1089	Nigerian Adults
Iheanecho,Chinony	2020	Nigeria	300	School Teachers
TejasviPK&MagendranJ, n.d.	2020	India	100	Patients attending medical college
Dixit et al	2020	India	150	Medical and para medical Students

Kadali	2020	India	225	Medical Students
Malla & KC	2021	Nepal	115	Medical and Paramedical Students
Sánchez-Sánchez et al	2021	Spain	203	Spanish population
Orayj et al	2021	Saudi Arabia	463	University students
Lee et al	2021	Korea	150	Korean adults above 65
Shah et al	2021	Nepal	620	University students
Chautrakarn et al	2021	Thailand	397	Working age population in Metropolitan area
Hiremath et al	2022	India	88	Medical students
Abdullah et al	2022	Brunei	335	University students
Wangler, J., & Jansky, M	2022	Germany	900	Primary care patients
Kassa et al	2022	Ethiopia	317	Healthcare professionals
Owusu et al	2022	Qatar	114	Qatar community

Table 2 Prevalence, symptoms, otc drug used, reasons for self-medication, factors associated with self medication

Author	**Prevalence rate**	**Symptoms**	**OTC drug used**	**Reasons for self-medication**	**Factors associated with self-medication**	**Gender**
Goyal et al.	69%	Pain & Fever Headache Cough & cold	Analgesics Antipyretics Antacids	Due to low-cost	Whenever they feel sick Discard it when the drug shows a change in colour, shape Unaware of drug effects	
H. Shah et al	91.5%	NOT REPORTED	Antipyretics NSAID Antacids	Knew the medicine Previous experience Busy lifestyle Similar medicines in the past	49.73% are aware of the active component of medicine 46.99% are aware about side effects of medicine 40.44% are aware about dosage of medicine	male (50.50% female. (Female(49.50 %
Tesfamariam, S	93.7%	NOT REPORTED	Analgesics Antipyretics	ease of accessibility (34%) saving time (24.4%), perception of being safe and tolerable (14.7%) saving money(5.6%) treating minor ailments (4.3%) and getting quick relief	Educational Level Religion occupation and knowledge regarding OTC drugs were significantly associated with risky practice. 6.9% had experienced drug-related problems following the consumption of OTC drugs.	Male(64.9%) Female(35.1 %)
Elsayed	53.2%	Headache Pain	Vitamins Analgesic-Paracetamol	they believe that multivitamins could protect	knowledge was associated with the level of education.	Male 47.2% Female52.8%

		Allergy heart pain		them from chronic diseases such as cancer, cardiovascular diseases, and Type 2 diabetes.		
Taklikar& Dobe	48.5%	Cough & Cold Fever Pain	NOT REPORTED	illnesses are not severe (39.4%), followed by the easy availability of over the counter drugs (21.4%), economic reasons–doctor's consultation fees (16.3%)	Self-medication practice was more prevalent among females (57.5%) The commonest source of self-medication was nearby medicine shops (59.3%) and 2.3% used old prescriptions for buying medicines. 21.7% were using leftover medicines available at home.	Male 42.5% Female 57.5%
Bekele et al	79.7%	Fever Headache Abdominal cramp	Paracetamol NSAID	Time-saving Quick relief	had good knowledge about the safety and effectiveness of OTC medications.	Male 60.5% Female 39.5%
Mathias et al	78.6%	NOT REPORTED	Antipyretics Antitussive	severe illness able to visit any doctor busy schedule previous prescription.	A significant association between the use of self-medication and the family background	Male 66.8% Female 55.9%
Ettebong& Bassi	69.4%	Headache Illness Cough Bodypain	NOT REPORTED	doctor/clinics too far convenience financial reasons time-saving	Community pharmacy shops (23.0%) and patent medicine stores (20%) were the most common sources	Male 52.6% Female47.4%
Iheanecho,Chinony	62.3%	NOT REPORTED	Vitamin supplements Analgesics Cough mixtures	NOT REPORTED	The majority of the respondents misused OTC drugs.	Male38% Female 62%
TejasviPK&MagendranJ, n.d.	63%	Fever Nausea Headache	Antipyretic	To save time cheaper options are easily available	49% of the participants purchased OTC drugs from outside pharmacies 28% of the participants experienced an adverse effect	
Dixit et al	86.67%	Pain Fever	NSAID	Minor illness Time-saving	13.85% of students experienced adverse effects.	
Ramanamurthy Kadali	71%	Headache Cough & cold	Analgesics Cough syrups Antipyretics	NOT REPORTED	76% of students knew the dose and frequency of a drug that they have taken,	Male-35.3% Female-64.7%

		Sore throat Fever	Antacids			
Malla & KC	46.08%	Headache fever	Antipyretics Analgesics Vitamins	NOT REPORTED	the most common source of drugs for self-medication was pharmacy (94.4%	Male-30.9% Female-60.9%
Sánchez-Sánchez et al	78.9%	Common cold	Analgesics Antidepressants	NOT REPORTED	consumption decreased as the age of the subjects increased. Women, youngsters with non-formal educational qualifications and individuals of a low–medium socioeconomic level residing in urban areas consumed more OTC drugs. significant associations were found between individual's socioeconomic status	Men-24.9% Female-75.1%
Orayj et al	85.3%	Headache Pain Fever	Painkillers Antipyretics Cough & Cold	Cheap & Easy to access To save time Cost of visiting a Doctor is high	Male students showed a significant lack of awareness and knowledge regarding the safety and reasons for OTC drugs. Sex, age, university level, and monthly income were significant factors affecting OTC drug use during examinations.	Male41.5% Female-58.5%
Lee et al	79.4%	NOT REPORTED	Analgesics External preparations Gastrointestinal drugs	NOT REPORTED	those who were educated on medication safety performed higher levels of safe practice than those who were not	Male-22.9% Female-77.1%
Shah et al	95.4%	Minor illness	Analgesic Antipyretic	Previous prescription	overconfidence because of my high level of education, and some generalized knowledge of commonly used medications.	Male-64.52% Female-35.48%
Chautrakarn et al	88.2%	Minor illness Easy access to pharmacy	NSAID Antibiotic	Presence of a pharmacist Store's proximity to the home	experienced adverse drug reactions some had severe symptoms that disrupted their daily	Male-24.3% Female-72%

					lives or required hospitalization. The most common adverse drug reaction was gastric upset caused by NSAIDs (6.6%), Female self-medicated more	
Hiremath et al	69.5%	Fever cold and headache	Analgesics Antipyretics Antihistamines	NOT REPORTED	11.3% of students experience adverse drug reactions to self-medication and are habitual to the drugs	Male-58% Female-42%
Abdullah et al	99.7%	NOT REPORTED	Cold and flu drugs Vitamins Antipyretics	Convenience Ability to self treat time-saving Low cost	Few of the students practiced improper habits in terms of OTC medicine use, suchas not reading the instructions or taking more than the recommended dose 9.9%) of the respondents experienced adverse effects from OTC medicine	Male-25.4% Female-74.6%
Wangler, J., & Jansky, M	65%	Cold & flu Sunburn Headache	NOT REPORTED	Don't want to see a doctor for minor issues. Simple to use Low dose.	NOT REPORTED	Male-50% Female-50%
Kassa et al	22.7%	NOT REPORTED	Antibiotics	Familiar with treatment options Need for rapid relief Respiratory problems Gastrointestinal problems	Self-medication with antibiotics was common among the study participants the practice leads to the risk of developing resistance it has risks of misdiagnosis.	Male-48.3% Female-51.7%.
Owusu et al	15.2%	NOT REPORTED	NSAIDs	NOT REPORTED	90% of the community pharmacists have at least good knowledge on the adverse effects of the medication class. In addition, more then half of the pharmacists educated patients on the dosage, administration, side effects, precautions, and contraindications of NSAIDs during their routine practices.	Male-78.8% Female-21.2%

4. Discussion

Through a thorough examination of the literature, our study attempted to analyze the self-medication situation as it stands today. There are currently articles on this topic published in literature from different nations. Through the use of questionnaires distributed during cross-sectional investigations, the attitudes, behaviors, and knowledge related to self-medication were evaluated. Studies carried out in 13 different countries were used to analyze the utilization of self-medication.

It is anticipated that variations in drug advertising, legal frameworks, and the availability of some pharmaceuticals without a prescription will affect trends in self-medication. Furthermore, eleven of the 23 studies that were taken into consideration were conducted in low- to middle-income nations [10,12,40,23,16,15,21,19]. Self-medication may be more prevalent in various countries due to the design and state of their healthcare systems, making it impossible to make meaningful comparisons due to the disparity in how different scholars view self-medication.

In countries with lower middle incomes, like India, the prevalence of self-medication has nearly doubled over the past ten years [18, 32, 17, 38, 36, 20]. Because of their stringent laws governing over-the-counter medications, Western nations such as Europe view self-medication practices as practically non-existent. Other nations, such as India, ought to follow suit [42]. Addiction to self-medication can lead to drug resistance, unwanted side effects, and in rare cases, even death. There could be variations in self-medication practices between Indians due to disparities in their social, health, and developmental backgrounds. By closely enforcing the legislation, developing and executing a national plan, and directing pharmacists to only provide medication upon presentation of a prescription, it is possible to curb the pervasive use of self-medication techniques in India.

Our research took into account 23 studies to determine the frequency and features of self-medication. The remembrance time and the criteria for self-medication were different in every investigation. Rather than concentrating on particular symptoms, the bulk of studies—13 in the general population and 10 in specific demographics—examined self-medication generally. Self-medication is a common practice that endangers people's health as well as that of their communities. Based on an analysis of 23 studies, the average prevalence rate of self-medication was found to be greater than 70% worldwide. Individuals who had finished secondary education or above were more likely to self-medicate.

There was a strong correlation found between education level and the chance of self-medication, with those with degrees being more likely to do so. Since most medical graduates do have a deeper comprehension of over-the-counter medications, along with their prescription and side effects, this has been attributed to their broad knowledge of the pharmaceutical. These results were also consistent with previous studies. Being able to understand the content on social media and having easy access to the internet could be a good reason for this tendency in the current environment. This investigation's publications used a range of questions to assess self-medication, which is consistent with findings from previous systematic reviews. Additionally, a number of recall intervals have been established in different studies[43].

Due to the lack of clarity, direct comparisons of studies or meta-analyses of their findings are not allowed as this could introduce bias into the internal validation of the findings. Furthermore, studies that looked at the prevalence of self-medication using a pre-established list of medicines might not have included all of the most widely used drugs, which could have led to biased prevalence results. For example, cross-sectional publications in this study are subject to certain limitations. This study indicates a notable lack of primary research involving self-medication, necessitating more accurately reported studies, well-designed studies, and a common definition of self-medication in this vacuum in the literature. Furthermore, the statistical validity and consistency are decreased in the absence of a meta-analysis.

5. Conclusion

Given that over 50% of research participants used self-medication, it seems to be a widespread practice. Self-awareness, confidence in one's capacity to identify sickness, and familiarity with the prescription were considered to be markers of the practice of self-medication. More prompt action is needed to stop the harm caused by self-medication activities. Because self-medication lowers the cost of prescription pharmaceuticals, it may improve healthcare. Conversely, improper self-medication may result in germ resistance, drug interactions, dangerous side effects, and incorrect diagnoses. Because of this, lawmakers and medical experts must work together to pass stringent laws that regulate and supervise acceptable self-medication practices. Likewise, extensive public health awareness efforts on various platforms, appropriate supervision of drug distribution, and legal action against medical malpractice should be given top priority. Ultimately, everyone will benefit from public education regarding safe methods of self-medication, the dangers of drug abuse, and the availability of an affordable, top-notch healthcare system.

In conclusion, several variables, such as age, health literacy, information accessibility, and opinions regarding the safety of over-the-counter medications, affect people's knowledge and attitudes regarding these medications. To make sure OTC medications are used correctly and safely, it is critical that people are knowledgeable about them and actively seek out reliable information about them. Resolving misunderstandings regarding OTC drug safety and efficacy and encouraging the responsible use of these medications are key responsibilities of healthcare providers. A thorough plan to enhance health and lessen OTC drug dependency must include consumer protection, ongoing research, tailored treatment, and public health education. By putting these ideas and recommendations into practice, we can improve the lives of those who experience problems and encourage safer, more efficient treatment techniques.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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