

Factors Associated with Over-the-Counter Medication Misuse Among Adults

Systematic Literature Review



Running head: Adult Medication Misuse Review

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ABSTRACT

Background: Over the counter (OTC) medications are widely used by adults for the management of common health conditions without requiring a prescription. So unsafe use of these medicines can lead to adverse drug reactions, drug interactions, overdose, dependence, delayed treatment, and other preventable medication-related harm.

Purpose and Method: This systematic literature review aimed to examine the factors associated with OTC medication misuse among adults and to analyses the research trends within the existing literature. Studies published from January 2009 to August 2026 were identified through PubMed and Google Scholar, supplemented by Research Rabbit, DOI searching, and reference-list searching. Studies involving adults and examining OTC, non-prescription, or self-medicated product use and associated factors were considered for inclusion. Quantitative, qualitative, and mixed-method primary studies available in English full text were included. The study-selection process followed the PRISMA 2020 guidelines, with 70 candidate studies screened and 50 studies included in the final review.

Results: The bibliometric analysis showed that research on OTC medication misuse has increased over the review period, with the highest number of included publications occurring in 2025. Most studies used quantitative methodologies, while mixed method and qualitative studies were less common. Saudi Arabia, India, and Ethiopia were among the most frequently represented countries in the reviewed literature. Common factors associated with unsafe OTC medication use included limited medication knowledge and health literacy, previous successful self-treatment, perceptions of illness severity, difficulties accessing healthcare, cost and time considerations, medicine availability, advice from social networks, and weaknesses in medicine regulation. The review also identified differences in research activity between countries and limitations in the methodological diversity of the existing evidence.

Value: This review provides a consolidated understanding of the major factors associated with OTC medication misuse among adults and highlights important trends and gaps within the current literature. The findings may support nurses, pharmacists, other healthcare professionals, researchers, and policymakers in developing medication-safety education and interventions to encourage responsible OTC medicine use and reduce preventable medication-related harm.

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Introduction

Over the counter (OTC) medicines are widely used for the self-management of common and minor health conditions because they can be obtained without a prescription. Although appropriate OTC medicine use can improve, and delays in seeking appropriate medical treatment(Akande-Sholabi & Akinyemi, 2023; Chautrakarn et al., 2021).

OTC medication misuse can occur when medicines are used at an incorrect dose or frequency, for longer than recommended, for inappropriate indications, or without adequate consideration of safety instructions and potential risks. Evidence also suggests that OTC medicine-use behavior may be influenced by several factors, including medication knowledge, age, education, accessibility of medicines, convenience, health literacy, and individual health-seeking behavior (Akande-Sholabi & Akinyemi, 2023; Chautrakarn et al., 2021; Tian et al., 2025).

The extent of OTC medicine use and unsafe practices varies considerably between populations. In Nigeria, 85.4% of surveyed adult pharmacy consumers reported self-medication with OTC medicines, while more than 95% of those participants reported at least one risky medicine-use practice (Akande-Sholabi & Akinyemi, 2023).OTC self-medication was reported among 88.2% of working-age adults in metropolitan areas of Thailand, where minor illness and convenient access to pharmacies were common reasons for self-medication (Chautrakarn et al., 2021).

OTC medicine use does not always represent misuse. (Tian et al., 2025). Reported that more than 80% of participants in Japan indicated that they would strictly follow instructions when using OTC medicines for cold and cough symptoms, although demographic, health-related, and health-literacy factors continued to influence OTC medicine-use behaviors. In addition,(Abraham et al., 2017).Found potentially inappropriate use of OTC sleep medicines among older adults, demonstrating that the safety of OTC medicine use can differ according to the population,

medicine type, knowledge, and individual characteristics(Abraham et al., 2017; Tian et al., 2025).

These findings indicate that OTC medication misuse is a multifactorial issue rather than a behavior caused by a single factor. Therefore, systematically reviewing existing studies is important to identify the factors associated with OTC medication misuse among adults and to understand the major research trends, methodological patterns, geographical distribution, and remaining gaps in the available evidence.

1.2 Motivation of the Study

The study is motivated by evidence showing substantial variation in the prevalence and nature of unsafe OTC medicine practices among adult populations. In Eritrea (Tesfamariam et al., 2019) reported that 93.7% of participants had practiced self-medication with OTC medicines and, among those who self-medicated, 81.8% demonstrated risky practices. Approximately 14.4% had taken more than the recommended dose, while 6.9% reported experiencing medicine-related problems following OTC use (Tesfamariam et al., 2019).

High levels of potential misuse have also been demonstrated among older adults, with Chladek et al. (2024) finding misuse in 79% of 144 participants. In contrast, a Sri Lankan community-based study conducted in Anuradhapura reported antibiotic self-medication in only 2.6% of participants, although convenience was reported by 70% of those who self-medicated and all had obtained the antibiotics from a pharmacy (Rathish & Wickramasinghe, 2020).

1.3 Problem Statement

Although OTC and non-prescription medication misuse has been studied in many countries, the existing research is scattered across different populations, medicine categories, and healthcare settings. Studies have examined areas such as general OTC medicine use, antibiotic self-medication, NSAID self-medication, and OTC misuse among older adults, making it difficult to obtain one clear understanding of the factors associated with misuse among adults (Nunes et al., 2016; Panda et al., 2017; Rathish & Wickramasinghe, 2020; Chladek et al., 2024).

There is also a clear methodological imbalance in this research area. Most available studies use quantitative, particularly cross-sectional, methods, while qualitative and mixed-method research is limited. In the present review, 47 of the 50 included studies were quantitative, while only one was qualitative and two used mixed methods. Furthermore, factors such as knowledge, accessibility, education, socioeconomic characteristics, and health-seeking behaviour differ across studies and settings (Kassie et al., 2018; Öztürk et al., 2019; Mannasaheb et al., 2022). Therefore, a systematic review is required to bring together the available evidence, identify consistent patterns, and highlight methodological and geographical gaps in research on OTC medication misuse among adults.

1.4 Research Questions

1. What are the predominant trends, methodologies, and research designs in literature concerning the factors associated with over-the-counter medication misuse among adults.
2. How do geographic distribution, international collaborations, and journal impact influence the research landscape and trends related to factors associated with over-the-counter misuse among adults.
3. What are the recurring themes, key concepts, research gaps, challenges, and limitations in literature regarding the factors associated with over-the-counter misuse among adults.

1.5 Research Objectives

- 1.To determine the predominant trends, methodologies, and research designs in the literature concerning the factors associated with over-the-counter medication misuse among adults.
- 2.To analyze how geographic distribution, international collaborations, and journal impact influence the research landscape and trends related to factors associated with over-the-counter misuse among adults.
3. To review the recurring themes, key concepts, research gaps, challenges, and limitations in the literature regarding the factors associated with over-the-counter misuse among adults.

1.6 Significance of the Study

This review may contribute to healthcare practitioners, especially nurses and pharmacists, by improving understanding of the factors linked with unsafe OTC medication use and supporting better patient education and counselling.

It may contribute to academics and researchers by identifying important methodological, geographical, and knowledge gaps that can guide future studies.

It may also contribute to healthcare managers and policymakers by providing evidence that can support medication-safety strategies, public awareness programmers, and policies aimed at reducing inappropriate OTC medication use.



2.0 METHODOLOGY

A systematic literature review was conducted to identify and analyses research concerning factors associated with OTC and non-prescription medication misuse among adults. The review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines to provide a structured and transparent study-selection process (Page et al., 2021).

2.1 Databases and Information Sources

Relevant studies were identified mainly through PubMed and Google Scholar. Research Rabbit was used as a supplementary discovery tool to identify related studies and citation connections. DOI searches and reference-list checking were also used to locate and verify relevant primary research articles.

2.2 Search Strategy and Keywords

The search strategy was developed according to the main concepts of the research topic. Search terms included:

“over-the-counter medication,” “OTC medicine,” “non-prescription medicine,” “self-medication,” “medication misuse,” “inappropriate use,” “drug misuse,” “adults,” “associated factors,” “determinants,” “predictors,” “knowledge,” and “accessibility.”

These terms were combined and adapted according to the search source to identify studies relevant to OTC and non-prescription medication misuse among adults.

2.3 Boolean Operators and Search String

Boolean operators AND and OR were used to combine the search terms. OR was used to connect similar terms, while AND was used to combine the main concepts.

An example of the search string was:

("over the counter" OR "OTC" OR "non-prescription" OR "self-medication") AND ("misuse" OR "inappropriate use" OR "abuse") AND ("adult" OR "older adult") AND ("associated factors" OR "determinants" OR "predictors" OR "knowledge" OR "accessibility")

2.4 Publication Period

The review included studies published from 2009 to 2026, providing a ten-year period of recent evidence concerning OTC and non-prescription medication misuse among adults. The final evidence set contained 50 eligible studies within this publication period.

2.5 Inclusion and Exclusion Criteria

The following criteria were applied to determine the eligibility of studies for this systematic literature review.

Inclusion Criteria	Exclusion Criteria
Studies published between 2009 and 2026	Studies published before 2009
Adult populations aged 18 years and above	Pediatric or adolescent-only studies
Primary quantitative, qualitative, or mixed-method studies	Systematic reviews, narrative reviews, commentaries, and editorials

Studies concerning OTC, non-prescription, or self-medicated medicines	Studies unrelated to OTC/non-prescription medication use
Studies examining misuse, inappropriate use, self-medication, abuse, associated factors, determinants, or predictors	Studies focusing only on prescribing, sales, policy, or healthcare-provider behavior
Full-text studies available in English	Conference abstracts or records without sufficient primary data



2.6 Prisma flow diagram

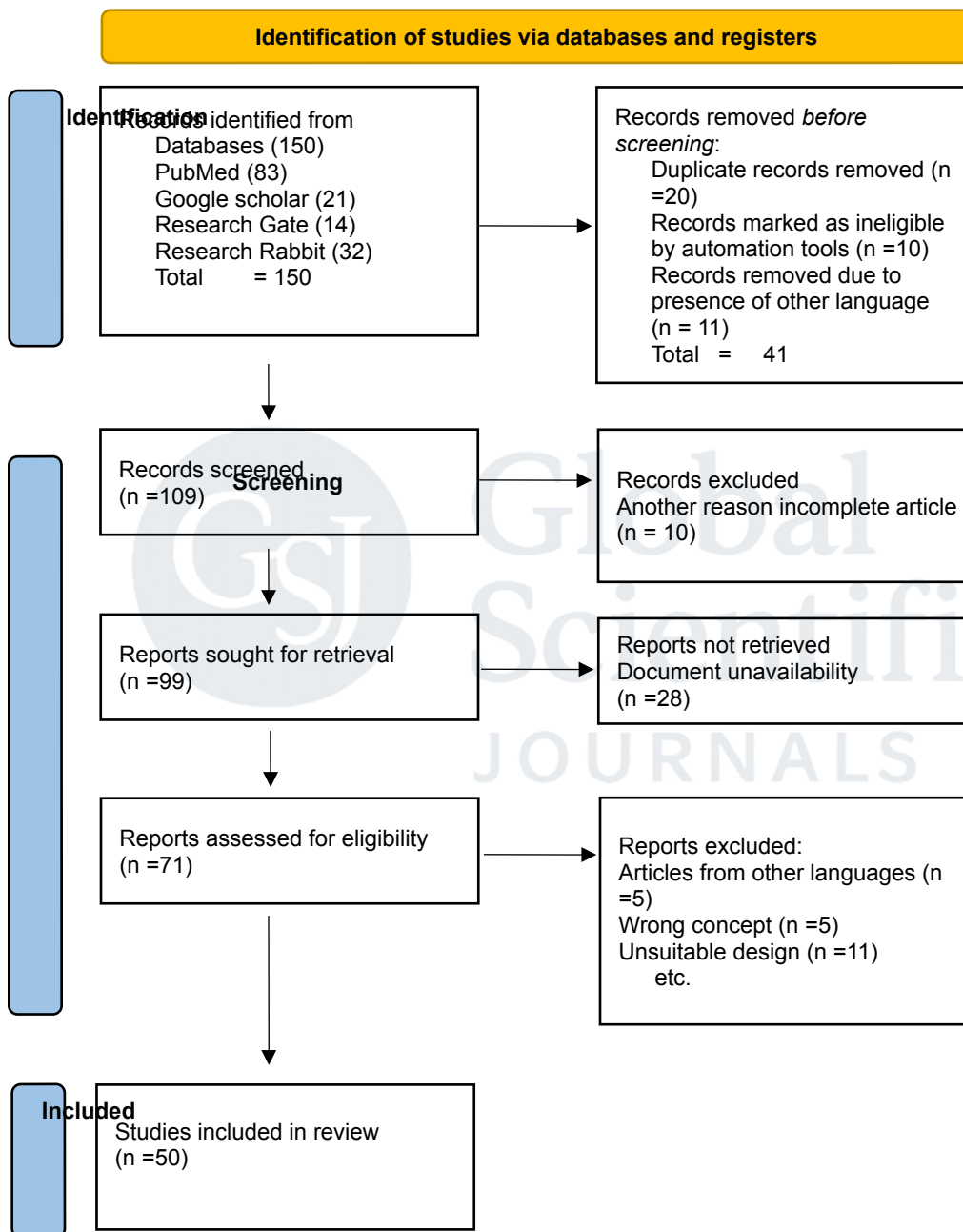


Figure 1: PRISMA Flow Diagram of Study Selection

3.BIBLIOMETRIC ANALYSIS

3.1 Growth Analysis

The timeline distribution of publications related to the topic “Factors Associated with Over the Counter (OTC) Medication Misuse Among Adults” demonstrates a general increase in research interest over time. Although the number increased to four publications in 2013, publication activity remained relatively low and fluctuated during the following years.

This increasing trend may be influenced by growing concerns regarding easy access to OTC medicines, inappropriate self-medication, lack of medication knowledge, adverse drug reactions, antibiotic resistance, and other risks associated with improper medication use. Researchers have therefore increasingly focused on factors such as knowledge, attitudes, education, accessibility, healthcare access, and sociodemographic characteristics that may influence OTC medication misuse.

Although the number of publications shown for 2026 is five, this should be interpreted cautiously because 2026 is still ongoing

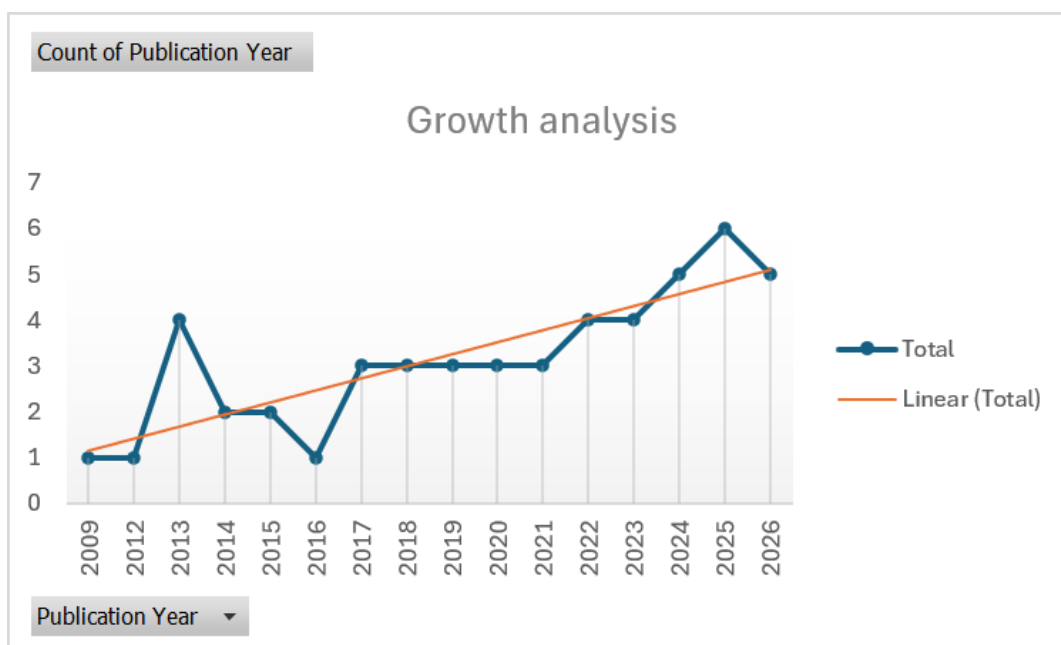


Figure 2: Growth Analysis of Publications

3.2 Credibility of Journals

Identifying the most credible and relevant articles was a challenging process because the topic covers a wide range of medication-use behaviors, self-medication practices, population groups, and associated risk factors. The table above presents a selection of prominent journals with high H-index values, strong overall rankings, and comparatively high impact scores, including Antibiotics, Frontiers in Pharmacology, BMC Public Health, International Journal of Drug Policy, and International Journal of Environmental Research and Public Health.

These journals contributed to the credibility of the review by providing reliable and evidence-based research related to OTC medication use, medication safety, self-medication, and public health.

Name of journal	No. of publications	Subject area	H-index	Overall ranking	Impact score	Publisher
Antibiotics	1	Biochemistry (Q1); Infectious Diseases (Q1); Microbiology (Q1); Pharmacology (medical) (Q1)	124	3261	5.83	MDPI
Frontiers in Pharmacology	1	Pharmacology (Q1); Pharmacology (medical) (Q1)	203	3395	5.07	Frontiers Media SA
BMC Public Health	4	Public Health, Environmental and Occupational Health (Q1)	225	2924	4.58	BioMed Central Ltd
International Journal of Drug Policy	1	Health Policy (Q1); Medicine (miscellaneous) (Q1)	112	1800	4.37	Elsevier B.V.
International Journal of Environmental Research and Public Health	3	Public Health, Environmental and Occupational Health (Q1); Health, Toxicology and Mutagenesis (Q2)	256	5527	4.17	MDPI
Frontiers in Public	1	Public Health, Environmental	138	4154	4.03	Frontiers Media

Health		and Occupational Health (Q1)				SA
Healthcare (Switzerland)	1	Leadership and Management (Q1); Health Informatics (Q2); Health Policy (Q2)	95	6187	3.86	MDPI
JAC- Antimicrobial Resistance	1	Infectious Diseases (Q1); Immunology (Q2); Microbiology (Q2)	36	4475	3.60	Oxford University Press
Innovation in Aging	1	Health Professions (Q1); Health/Social Science (Q1); Life-span Studies (Q1); Geriatrics and Gerontology (Q2)	37	4113	3.46	Oxford University Press
International Journal of Clinical Pharmacy	1	Pharmaceutical Science (Q1); Pharmacy (Q1); Pharmacology (Q2); Toxicology (Q2)	77	6611	3.29	Springer Science and Business Media Deutschland GmbH

3.3 Sites of Publication

According to the collected data, a variety of publication sites contributed to the literature related to factors associated with over the counter (OTC) medication misuse among adults. Among the identified sources, PLOS ONE represented the highest contribution with 7 publications, indicating its major role in publishing research related to self-medication, medication misuse, and public health. BMC Public Health contributed 4 publications, while the International Journal of Environmental Research and Public Health contributed 3 publications, demonstrating their significant involvement in research on OTC medication use, self-medication practices, and associated risk factors.

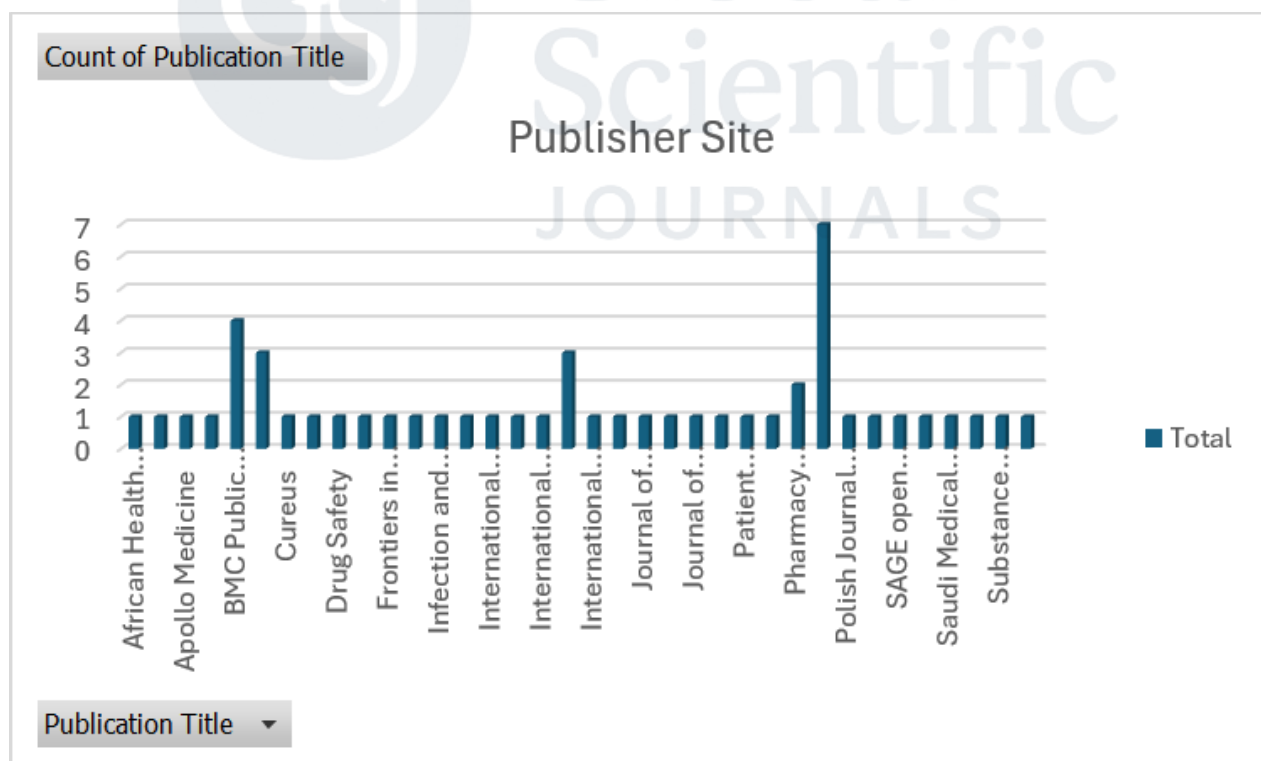


Figure 3: Distribution of Publications by Publication Site

3.4 Most Influential Authors

The analysis of influential authors was based on citation counts, H-index, and i10-index values. Among the identified authors, Karem Alzoubi has the highest number of citations (44,644), indicating a strong academic influence. Similarly, Saralees Nadarajah demonstrates a high level of research impact with 31,743 citations.

Other notable contributors include Mohamed Azmi Hassali, Mainul Haque, Mário Gajdács, and Maryse Lapeyre-Mestre, who have substantial citation records and strong H-index values. Their research contributes to areas such as pharmacy practice, pharmacology, medication use, pharmacoepidemiology, and medicine-related behaviors.

Name of the Author	Citations	H-Index	i10-Index
Karem Alzoubi	44,644	76	449
Saralees Nadarajah	31,743	75	445
Mohamed Azmi Hassali	23,907	76	457
Mainul Haque	21,980	62	316
Mário Gajdács	19,751	57	139
Maryse Lapeyre-Mestre	19,012	70	330
Abdallah Y. Naser	16,642	43	123
Tomoki Nakaya	10,949	55	178
Shazia Jamshed	9,136	39	107
Taís Freire Galvão	8,919	39	100

3.5 Geographical Distribution

The map shows the geographical distribution of the countries represented in the reviewed studies on over the counter (OTC) and non-prescription medication misuse among adults. The studies are spread across several parts of the world, with noticeable concentrations in the Middle East, South Asia, Europe, Southeast Asia, and North America. Countries such as Saudi Arabia, Jordan, India, Bangladesh, Poland, and the United States show stronger representation, while many other countries are represented by only a small number of studies. The limited coverage across parts of Africa, South America, Central Asia, and Oceania highlights a geographical gap in the literature and indicates the need for more research from underrepresented regions.



Figure 4: Geographical Distribution of Included Studies

3.6 Regional Insights

This map provides a clear snapshot of the regional distribution of research on over the counter (OTC) and non-prescription medication misuse among adults. Each point represents a country or study location included in the review.

Most of the studies are concentrated in the Middle East, South and Southeast Asia, Europe, and North America. Countries such as Saudi Arabia, Jordan, India, Bangladesh, Poland, and the United States show stronger representation, indicating that much of the available evidence comes from these regions.

What stands out is the limited representation from many parts of Africa, Latin America, Central Asia, and Oceania. This regional gap is important because medication access, healthcare-seeking behavior, cultural practices, economic conditions, and medicine regulations can vary considerably between regions.



Figure 5: Regional Distribution of Included Studies

3.7 Distribution of Universities represented by Authors

This map shows the geographical distribution of universities and institutions represented by authors in the reviewed studies. Each blue pin represents an institution contributing to research on OTC and non-prescription medication misuse among adults.

The strongest clusters can be seen across Europe, the Middle East, South and Southeast Asia, and North America. Several institutions are also represented in parts of Africa, showing that research in this field involves universities from a broad range of regions.

Overall, the map shows that the review includes research from a diverse group of universities worldwide, but greater participation from underrepresented regions would help provide a more balanced and globally relevant understanding of factors associated with OTC medication misuse among adults.



Figure 6: Geographical Distribution of Universities Represented by Authors

3.8 Methodologies

The methodological analysis of the selected studies shows that quantitative research was the dominant approach, accounting for 46 of the 50 articles (92%). Most of these studies used cross-sectional surveys and statistical analyses to examine the prevalence, patterns, determinants, and factors associated with OTC and non-prescription medication misuse among adults.

Qualitative studies accounted for two articles (4%). These studies provided deeper insights into individuals' experiences, perceptions, motivations, and behaviors related to self-medication and medication misuse.

Mixed-method studies also represented two articles (4%), combining quantitative and qualitative approaches to explore both measurable patterns of medication misuse and the underlying reasons influencing these behaviors.

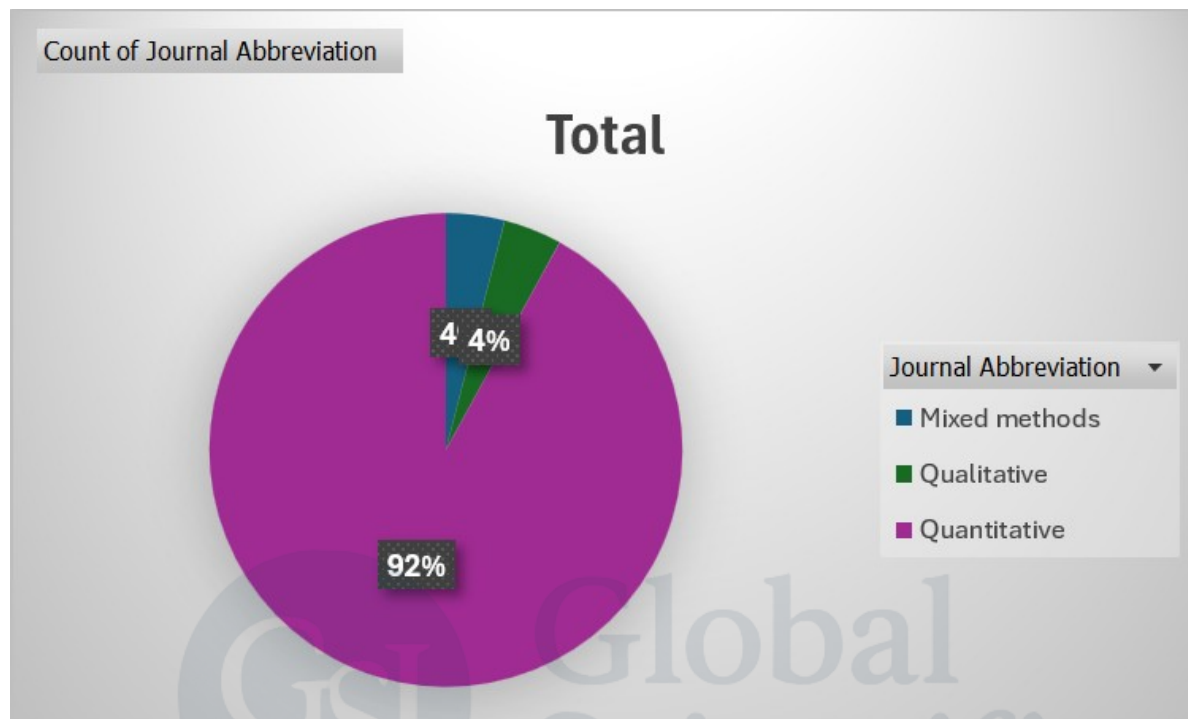


Figure 7: Distribution of Included Studies by Research Methodology

3.9 Co- Author Occurrences

The co-author network visualization illustrates the collaboration patterns among researchers contributing to studies on over the counter (OTC) and non-prescription medication misuse among adults. The map shows a highly interconnected group of authors, with researchers such as Mainul Haque, Golam Mohammad Kibria, Md Zakirul Islam, Sayeeda Rahman, Zainal Zulkifli, and Aqil Mohammad Daher forming part of the main collaboration network.

The dense links between the authors indicate strong co-authorship within this research group and demonstrate close academic collaboration and knowledge sharing. However, the network is mainly concentrated within a single connected cluster, suggesting that wider collaboration between different author groups and institutions is comparatively limited.

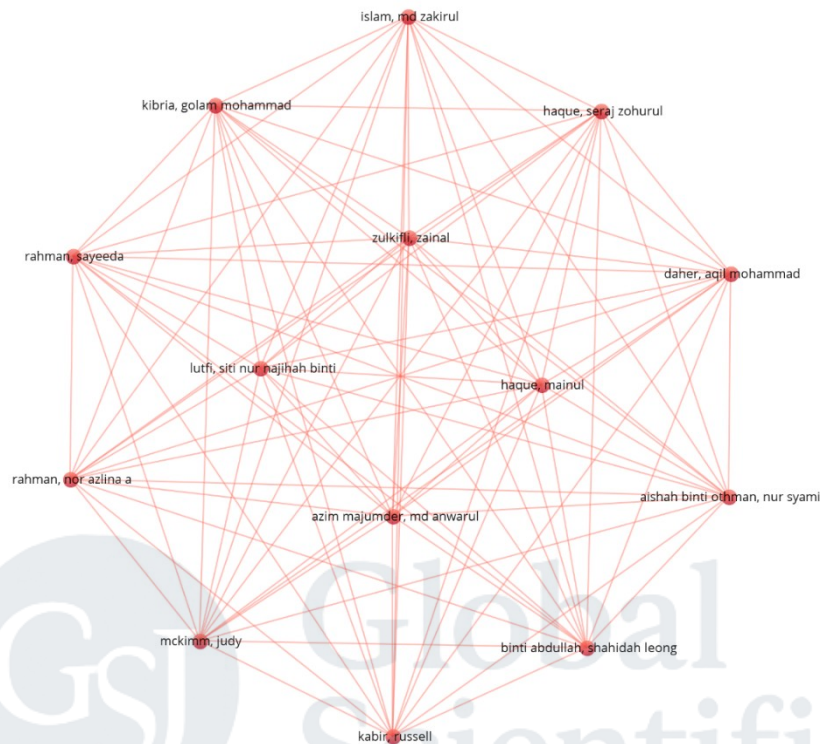


Figure 8: Co-Author Network Visualization

3.10 Keyword Occurrences

The keyword co-occurrence network visualization generated using VOS viewer shows several interconnected clusters related to OTC and non-prescription medication misuse among adults. Each node represents a keyword, while the size of the node indicates how frequently that keyword appeared in the selected studies. The links between keywords show how often the terms occurred together within the same publications.

The most prominent keyword in the network is “self-medication,” indicating that this is the central concept within the reviewed literature. Other frequently occurring keywords include “prevalence,” “antibiotic,” “use,” “medication,” “drug,” “participant,” “attitude,” “population,” “OTC drug,” and “misuse.” These terms demonstrate that much of the existing research focuses on the prevalence and patterns of self-medication, inappropriate use of medicine, and the factors influencing these behaviors.

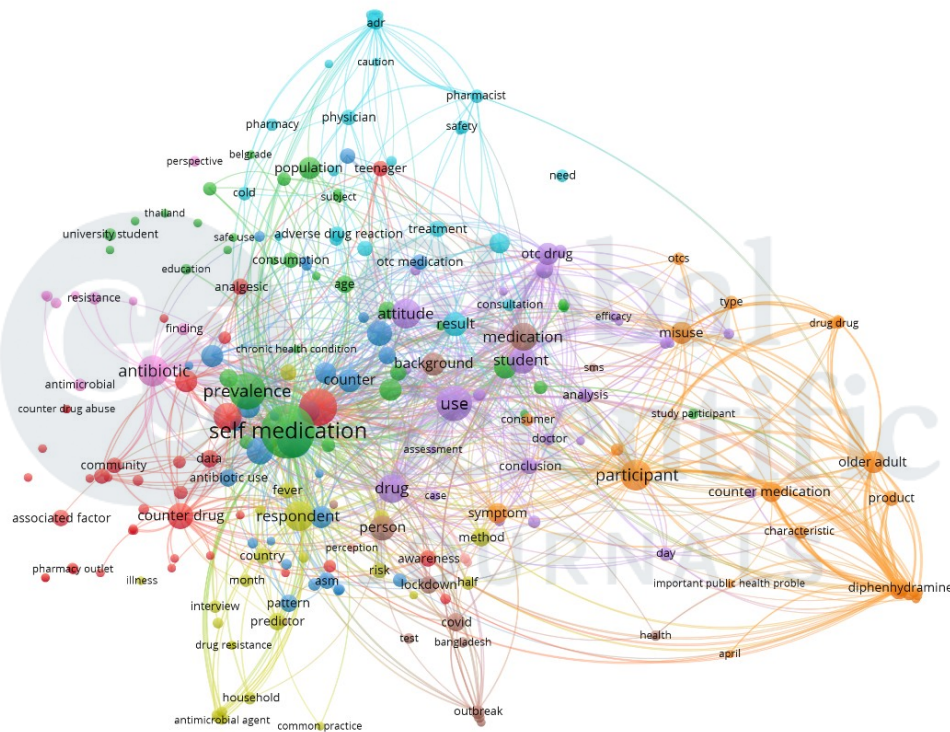


Figure 9: Keyword Co-Occurrence Network Visualization

3.10.1 Keyword Occurrence Clusters

The table below provides a clearer understanding of the nine color-coded clusters identified in the VOS viewer analysis and the main keywords represented within each cluster.

Cluster Color	Main Keywords
Red	Prevalence, antibiotic, counter drug, community, associated factor, awareness, pharmacy outlet
Green	Self-medication, Population, consumption, age, education, student, university student, safe use, chronic health condition
Light Blue	Pharmacist, physician, pharmacy, safety, adverse drug reaction, treatment, OTC medication, consultation
Blue	Background, counter, ASM, pattern, country, antibiotic use, result
Purple	Use, medication, drug, attitude, OTC drug, analysis, consultation
Orange	Participant, misuse, older adult, counter medication, product, diphenhydramine, drug-drug
Pink	Antibiotics, resistance, antimicrobial, counter drug abuse
Yellow	Respondent, risk, predictor, fever, interview, drug resistance, household
Brown	Person, perception, symptom, test, Bangladesh, outbreak, COVID

3.11 Thematic Analysis

The visualization was generated using VOS viewer. Larger and brighter terms indicate keywords with greater occurrence and local density, while terms positioned closer together appeared more frequently within the same studies. The colored areas represent related themes concerning knowledge, self-medication practices, medication misuse, student populations and OTC medicine use among older adults.



Figure 10: Thematic Density Visualization of Keywords

3.12 Radar Analysis

Scores range from 1, representing the lowest relative prominence, to 5, representing the highest. OTC drug use was the most prominent theme, followed by medication misuse, self-medication behavior, self-medication practice and general OTC medication use. These scores describe the relative emphasis of the themes and do not represent prevalence, effect size or statistical significance.

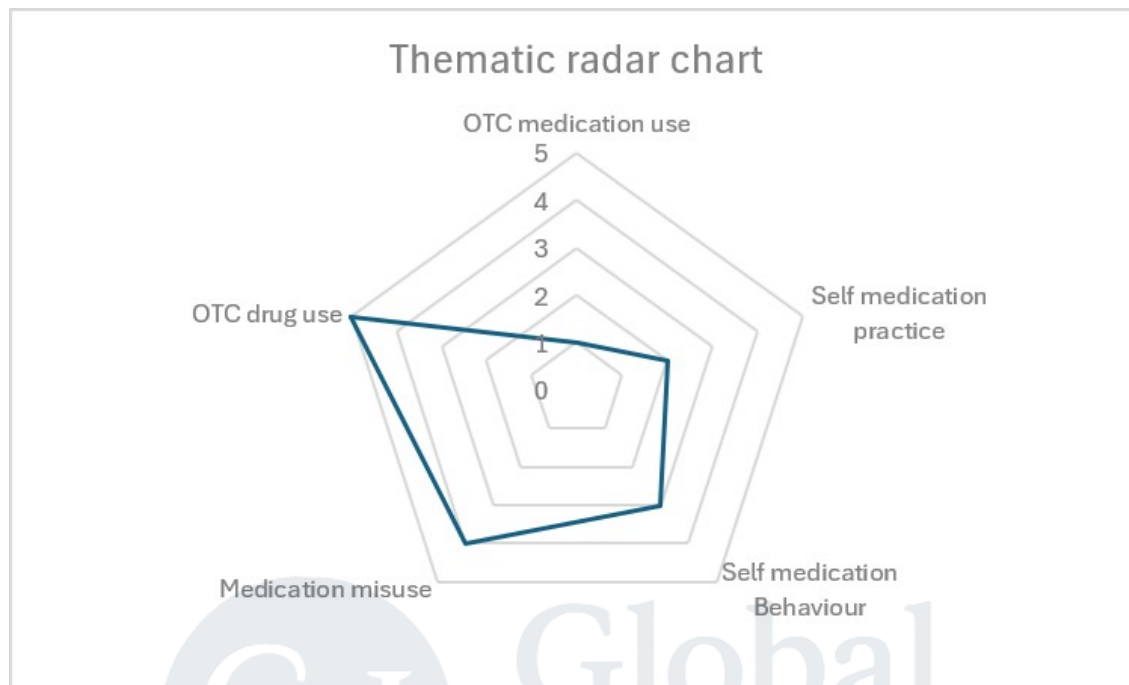


Figure 11: Thematic Radar Chart

4.IDENTIFICATION OF GAPS

Empirical Gap: An empirical gap is evident because most existing studies on OTC medication misuse use quantitative cross-sectional surveys and self-reported information. Although these studies identify prevalence and associated factors, they provide limited evidence about causal relationships or changes in misuse behavior over time. There is also insufficient evidence from

longitudinal studies, intervention studies, and mixed-method research evaluating whether pharmacist counselling, public education, or stronger regulatory measures can reduce OTC medication misuse. Therefore, further research using diverse study designs and objective measurements is needed.

Population Gap: A population gap exists because many studies focus on specific groups, such as university students, healthcare students, and adults from selected urban communities. Older adults, rural populations, people with chronic illnesses, individuals taking multiple medicines, and adults with limited access to healthcare remain underrepresented. Research is also concentrated in the Middle East, South and Southeast Asia, Europe, and North America, with limited representation from Africa, Latin America, Central Asia, and Oceania. This restricts the generalizability of the findings to the wider adult population.

Methodological Gap

A major methodological gap in existing literature is the heavy dependence on quantitative cross-sectional research. Of the 50 studies included in this review, 46 (92%) were quantitative, while only two (4%) were qualitative and two (4%) used mixed methods. Although cross-sectional studies are useful for identifying prevalence and associated factors, they cannot establish causal relationships or explain how medication misuse changes over time. The limited use of qualitative and mixed method approaches also means that adults' personal experiences, motivations, decision-making processes and barriers to seeking professional care remain insufficiently explored. Future research should therefore include more qualitative, mixed-method, longitudinal and intervention studies, supported by standardized definitions and validated measurement tools.

5. DISCUSSION

The findings of this review indicate that over the counter (OTC) medication misuse among adults is influenced by several personal, social, economic, and healthcare-related factors. Limited medication knowledge and health literacy, previous successful self-treatment, perceived severity

of illness, and positive attitudes toward self-medication were commonly associated with inappropriate OTC medication use. These findings suggest that OTC medication misuse is a complex behavior influenced by multiple interconnected factors rather than a single caused by a single factor (Kassie et al., 2018; Öztürk et al., 2019).

Healthcare accessibility and economics also played an important role in adults' decisions to use OTC medicines without professional guidance. High consultation costs, long waiting times, limited access to healthcare facilities, and the convenience to obtain quick symptom relief may encourage adults to treat themselves. The easy In addition, the easy availability of medicines through community pharmacies and other retail outlets can increase the risk of inappropriate medicine selection, incorrect dosage, prolonged use, and harmful drug interactions (Rathish & Wickramasinghe, 2020; Mannasaheb et al., 2022).

Social and regulatory factors were also identified within the reviewed literature. Advice from family members, friends, previous prescriptions, and information obtained from the internet may influence medicine-use decisions. Weak enforcement of medicine regulations and the sale of restricted medicines without prescriptions may further make also contribute to unsafe practices. These findings highlight the important roles of pharmacists, nurses, and other healthcare professionals in providing medication counselling, improving public awareness, and encouraging adults to seek professional advice when necessary.

However, several limitations within the existing evidence were identified. Most of the included studies used quantitative cross-sectional designs and self-reported data, while making it difficult to determine causal relationships or changes in behavior over time. Qualitative and mixed-method studies were limited, reducing understanding of adults' personal experiences and motivations. Variations in the definitions of misuse, sampling methods, population groups, and measurement tools also make it difficult to compare findings across studies.

The geographical analysis showed that research was concentrated in the Middle East, South and Southeast Asia, Europe, and North America. Evidence from Africa, Latin America, Central Asia, and Oceania remained limited. Since cultural practices, healthcare access, economic conditions, and medicine regulations vary across regions, findings from heavily represented countries may not apply to all adult populations. Wider international collaboration and further research in

underrepresented regions are therefore needed to develop culturally appropriate medication-safety interventions.

6.0 LIMITATIONS

One limitation of this review is that only full-text studies published in English were included. Relevant studies published in other languages or unavailable as full text may therefore have been excluded. This may have caused language and availability bias and limited the inclusion of evidence from countries where research is commonly published in languages other than English.

The literature search was conducted mainly through PubMed and Google Scholar, while Research Rabbit, DOI searching, and reference-list searching were used as supplementary methods. Although these sources identified a broad range of studies, relevant articles indexed only in other databases may have been missing. The exclusion of grey literature, unpublished research, and conference papers may also have increased the risk of publication bias.

Another limitation concerns the quality and comparability of the available evidence. Most included studies used quantitative cross-sectional designs and self-reported data. Although these methods are useful for identifying prevalence and associated factors, they cannot establish causal relationships or explain how OTC medication misuse changes over time. Differences in definitions, sampling methods, population groups, medicine categories, and measurement tools also made direct comparison between studies difficult.

Finally, the available evidence was concentrated in selected countries and population groups. Several parts of Africa, Latin America, Central Asia, and Oceania were underrepresented. Rural adults, older adults, people with chronic illnesses, and individuals taking multiple medicines were also not adequately represented. Therefore, the findings may not be generalizable to all adult populations or healthcare systems. Bibliometric indicators such as citation counts, H-index values, and journal impact measures may also change as new research is published.

7.0 FUTURE RESEARCH DIRECTIONS

Future research should include more qualitative and mixed-method studies to explore adults' experiences, beliefs, motivations, and decision-making processes related to OTC medication misuse. Longitudinal studies are also needed to examine how misuse develops over time and identify factors that predict repeated or harmful medication-use behavior.

More intervention-based studies should be conducted to evaluate strategies for reducing unsafe OTC medication use. Future research should examine the effectiveness of pharmacist- and nurse-led counselling, medication-safety education, clearer medicine labelling, digital health messages, and public awareness programmers.

Researchers should use clear and standardized definitions of OTC medication misuse, inappropriate self-medication, and risky medication practices. Validated measurement tools and consistent reporting of medicine type, dosage, frequency, duration, source of advice, and medication-related harm would improve comparisons between studies and support future meta-analyses.

Further research is needed in underrepresented regions and among populations at greater risk of medication-related harm. These populations include rural communities, older adults, people with chronic illnesses, individuals taking multiple medicines, and adults with limited health literacy or restricted access to healthcare. Multi-country studies would also help identify how culture, medicine costs, pharmacy access, healthcare availability, and regulatory enforcement influence OTC medication misuse.

Future studies should also examine emerging sources of OTC medicine information and access, including online pharmacies, social media, and internet-based health advice. Collaboration among nurses, pharmacists, physicians, public-health researchers, and regulatory authorities will be important for developing culturally appropriate and evidence-based strategies that promote responsible OTC medication use among adults.

8. CONCLUSION

This review highlights that over the counter (OTC) medication misuse among adults is influenced by multiple personal, social, economic, and healthcare-related factors. Limited medication knowledge and health literacy, previous successful self-treatment, perceived illness severity, medicine availability, healthcare costs, time constraints, and advice from family or friends were commonly associated with unsafe OTC medication use (Kassie et al., 2018; Öztürk et al., 2019).

The findings also emphasize the important role of pharmacists, nurses, and other healthcare professionals in promoting safe medication practices. Patient counselling, public education, appropriate medicine labelling, improved healthcare access, and stronger enforcement of medicine regulations may help reduce inappropriate self-medication and prevent medication-related harm (Rathish & Wickramasinghe, 2020; Mannasaheb et al., 2022).

Despite the growing research interest in this area, several gaps remain, including limited qualitative and mixed-method evidence, inconsistent definitions and measurement methods, and insufficient research involving underrepresented populations and regions. The dominance of cross-sectional studies also limits understanding of causal relationships and changes in OTC medication misuse over time.

In conclusion, OTC medication misuse is a significant public health concern requiring coordinated action from healthcare professionals, researchers, policymakers, and regulatory authorities. Future research should use standardized definitions, longitudinal and intervention-based designs, and more diverse adult populations to identify the most influential factors and develop effective strategies for promoting responsible OTC medication use.

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