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A Review on Dispensing Errors, Medication Safety, and Pharmacist Interventions in Community Pharmacy

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ABSTRACT

This article review explores key issues surrounding medication safety, the occurrence of dispensing errors, and the vital role of pharmacists' interventions in community pharmacy practice. Dispensing errors, often resulting from high workloads, miscommunication, or incomplete patient information, can lead to serious patient harm. While pharmacists are well-positioned to prevent these errors through patient counseling and safe dispensing, their role remains underrecognized and insufficiently supported within the healthcare system. To gather relevant evidence, several journal databases including Google Scholar and PubMed were utilized. The review was limited to English-language studies published between 2018 and 2025 and focused on international, national, and local contexts. Both quantitative and qualitative studies were included, and keyword filtering with terms such as "dispensing errors," "medication safety," and "pharmacy intervention" was applied to narrow the search.

Findings from this review align with those of Um et al. (2024), who reported dispensing error rates ranging from 0% to 33.3%, and with Lumanta et al. (2023), who identified poor communication and lack of patient information as major contributors. Similar to Ravi et al. (2022) and Ngo et al. (2024), this study highlights the critical yet often underutilized role of pharmacists in improving medication safety. However, unlike previous studies that focused primarily on hospital settings, this review emphasizes the unique challenges and opportunities for intervention in community pharmacies, particularly in low-resource environments such as the Philippines.

Keywords: Medication Safety, Dispensing Errors, Pharmacist Interventions, Community Pharmacy Practice, Patient Counseling.

1. Introduction

Medication safety is one of the most important aspects of pharmacy practice, as even small errors in dispensing can lead to serious consequences for patients. Every day, pharmacists handle countless prescriptions, and in that fast-paced environment, mistakes like giving the wrong medication, dose, or instructions may occur frequently. These dispensing errors, whether due to high workloads, miscommunication, or lack of access to complete patient information, can cause anything from minor side effects to life-threatening complications (Tariq, R. et al., 2024). Consequently, the pharmacist's role has evolved beyond mere dispensing. They're no longer just dispensers of medicine, they're key players in ensuring treatment is safe and effective. Through proper counseling, reviewing medications, and catching potential problems before they reach the patient, pharmacists make a real difference in healthcare outcomes (University of Findlay, 2023).

In the Philippines, this issue is especially important. Many Filipinos rely on pharmacists for advice, especially in areas where doctors are hard to reach. At the same time, challenges like self-medication, loosely enforced prescription rules, and inconsistent pharmacy practices make medication safety a pressing concern. While pharmacists are in a great position to help, their role in preventing medication errors is not always fully supported or recognized (Loquias, R. et al.,2012) . Therefore, it is imperative to examine strategies for improving medication safety, reducing dispensing errors, and strengthening the pharmacist's role in patient care to build a safer, more efficient, and patient-centered pharmacy practice in the country.

2. Methodology

2.1 Search strategy

Several journal databases were used during the review process such as Google Scholar and PubMed. Each database had specific limitations, such as restricting the language to English, focusing on international, national, and local, and including only studies between 2018-2025. Both quantitative and qualitative studies were included. Keyword filtering was employed using search terms like 'dispensing errors,' 'medication safety.' and 'pharmacy intervention' to narrow down relevant studies. The search commenced on July 1, 2025 (The Catholic University of America, 2019; van Hoorn et al., 2016).

The selected literatures were focused on community pharmacy settings that reported dispensing errors, addressed medication safety, and implemented pharmacy interventions. Studies that did not involve these key themes were excluded to ensure relevance to the objective of the review.

2.2 Study Selection

The studies selected for screening focused primarily on community pharmacy settings, particularly those that reported dispensing errors, explored issues related to medication safety, and described the implementation of pharmacy interventions. Literature was included if it provided relevant data on the causes, impact, and management of such incidents (Hjørland, 2023). Both local and international studies published between 2018-2025 were considered, provided they were written in English. Additionally, the screening process involved an evaluation of each study's design, potential sources of bias, and methods of data analysis (Althubaiti, 2016; Drucker et al., 2016). The review specifically emphasized learning outcomes related to enhanced medication safety practices, minimized dispensing errors, and the overall effectiveness of pharmacy interventions within community pharmacy settings.

2.3 Screening Process

Article screening was conducted independently by five reviewers, who assessed the titles and abstracts for relevance based on the predefined inclusion criteria. Studies that did not meet these criteria were excluded. Any disagreement during the screening process was resolved with the involvement of a third reviewer. Articles that passed the initial screening underwent full-text evaluation. Only those that fully met all inclusion criteria after thorough review were included in the systemic review and subsequently subjected to data extraction and analysis.

AUTHORS	METHODS	RESULTS
Dispensing Errors		
1. Al-Worafi (2018)	Conducted over four months, only 7 out of 30 invited pharmacies participated. Pharmacy staff recorded dispensing errors using a data collection form after being briefed on the study.	A total of 35 errors (0.80%) were reported, with the most common being wrong dosage form, followed by wrong quantity, strength, and drug. Major causes included poor handwriting on prescriptions, similar packaging, handling multiple patients simultaneously, and look-alike drug names.
2. Um et al. (2024)	This study analyzed 62 out of 4,216 reviewed articles published between 2010 and 2023 that reported on dispensing errors in pharmacy settings. Most studies were conducted in hospital pharmacies (71%), while a smaller number focused on community pharmacies. The methods for measuring errors varied, using different denominators such as dispensed items, doses, or patients.	Dispensing error rates ranged from 0% to 33.3%, with an overall pooled prevalence of 1.6% and high variability among studies ($I^2 = 100\%$). Most of the included studies were of moderate quality, and only a few reported consistent methods for identifying errors.
3. Lumanta et al. (2023)	The review was conducted using various journal databases, including PubMed, Journal of Pharmaceutical Health Services Research, International Journal for Quality in Health Care, ScienceDirect, Google Scholar, National Library of Medicine, etc. From these databases, articles are reviewed and discussed. The search terms included the following: medication-related errors; drug-related errors; pharmaceutical care issues; pharmacy; community pharmacy; patient safety;	The major medication-related errors identified by the community pharmacists are prescribing errors which include wrong dosage, wrong medicine, wrong drug form, wrong administration or use of medication, as well as illegible or unreadable prescriptions. Besides that, other medication errors were also discovered such as duplicative therapy, misuse, abuse of drugs, drug-to-drug interactions, and non-adherence. These errors can negatively affect the patients' safety as these cause toxicity, unwanted adverse drug events, and

	patient outcomes; and others. The researchers reviewed studies conducted from different locations globally with no restrictions on the year of publication.	increase the potential consequences for patients' morbidity and mortality

Medication Safety

1. Ravi et al. (2022)	The researchers used the enhanced Arksey and O'Malley framework by Levac and colleagues, which implements medication safety through nurse-pharmacist collaboration for community-dwelling adults. This included 23 studies. The data of the study were extracted according to country of origin, intervention, and relevance to the current review. It consists of 3,464 participants across 23 studies. Nurse-pharmacist collaboration in community settings is still developing.	A literature review identified five key sub-themes: (1) creating new opportunities to improve medication safety, (2) supporting complementary interprofessional roles, (3) promoting efficient and cost-effective safety measures, (4) highlighting the diverse assessments performed by each profession, and (5) recognizing that poor collaboration often results in incohesive teams.
2. Ngo et al. (2024)	The study aimed to assess clients' perceptions of the UPCP Telepharmacy Service on their knowledge, decision-making, and medication safety using a cross-sectional design through guided voice-call interviews. A total of 72 participants met the inclusion criteria, with the majority being females (72.22%), aged 30–59 (51.39%), college graduates (44.44%), and earning below PhP 11,000 monthly (47.22%). Most respondents were from Region IV-A (36.11%).	Clients reported very positive perceptions of the drug information advice ($\bar{X} = 4.510$) and high satisfaction with the service ($\bar{X} = 4.625$). They perceived that the advice positively influenced their medication decision-making ($\bar{X} = 4.514$) and understanding of medication safety ($\bar{X} = 4.522$). Regression analysis showed a significant positive association between clients' perception of the advice and its perceived effect on decision-making ($r = 0.5033$; $p = 0.000$) and medication safety ($r = 0.4320$; $p = 0.004$).
3. Sobrevilla et al. (2025)	This study evaluated the effectiveness of the Residential Medication Management Review (RMMR) program in improving medication use among elderly residents in two nursing homes in Davao City. Using a pre-post design, clinical pharmacists conducted medication reviews for residents aged 60 and above.	Results showed significant improvements in medication appropriateness, with reductions in Medication Appropriateness Index (MAI) scores for effectiveness, directions, and drug interactions. Drug-related problems also decreased, based on PCNE classification. Cost-effectiveness remained unchanged, indicating no added financial burden. The study supports pharmacist-led reviews as an essential part of elderly care.

Pharmacist Intervention

1. Loh et al. (2023)	This study utilised a simulated client method. A research assistant, acting as a simulated client, visited community pharmacies in the Klang Valley, Malaysia to consult the pharmacists on the treatment of a cough experienced by his father. Upon leaving the pharmacy premise, the simulated client entered the pharmacist's responses in a data collection form which was structured based on pharmacy mnemonics for the response to symptoms,	The simulated client visited a total of 100 community pharmacies. None of these community pharmacists practised adequate patients' data collection, with only a low proportion who practised all the components studied under medication information evaluation (13%), formulating a drug therapy plan (15%) and monitoring and modifying the plan (3%). Of the 100 community pharmacists, 98 recommended treatment but none of them provided all

	OBRA'90 on counselling elements, the five practice principles of pharmaceutical care by the American Pharmacists Association and literature review.	the counselling elements studied in implementing the drug therapy plan.
2. Bishopet al. (2019)	A narrative overview strategy was employed to identify papers on antibiotic stewardship and the role of the community pharmacist. Our review examined potential stewardship strategies and interventions within community pharmacy practice that provide opportunities for pharmacists to engage or lead in the reduction of antimicrobial resistance.	The research describes five promising community pharmacist-led intervention strategies: Collaborative Practice Agreements (CPAs), point-of-care (POC) testing, patient consultations, academic detailing and serving as an advocate for patients and other healthcare providers stewardship.
3. Togonon et al. (2024)	This study utilized three sampling methods: purposive sampling for selecting participants that would satisfy the inclusion criteria, convenience sampling for recruiting community pharmacists they were acquainted with, and snowball sampling for enlisting respondents through referral by the mentor and professors. The researchers recruited 30 eligible pharmacists who met the inclusion criteria through an invitation that was sent to the community pharmacists.	The study reveals a notable improvement in pharmacists' self-efficacy post-training, corroborating earlier findings. Additionally, the efficacy of the smoking cessation training in augmenting pharmacists' capacity to deliver cessation services in Davao City is evidenced by the proficient performance of all respondents in counseling sessions based on the 5 A's approach.

Interpretation of Dispensing Error Rates and Causes

Dispensing errors are one of the most common medication related mistakes encountered in both hospital and community pharmacy practice. In the systematic review conducted by Um et al. (2024), it was found that dispensing error rates ranged from 0% to as high as 33.3% depending on the setting and study, with a pooled prevalence of 1.6%. Lumanta et al. (2023) also emphasized that other contributing factors are poor communication, unclear prescription instructions, and inadequate patient information. Errors typically involve wrong dosage form, incorrect quantity, or dispensing the wrong drug altogether. These findings underline the importance of pharmacy professionals being well-trained in medication safety protocols and error detection, especially in fast-paced community pharmacy environments where such mistakes can easily occur.

Challenges in Measuring and Reporting Dispensing Errors

Accurately detecting and reporting dispensing errors presents a challenge in pharmacy practice, especially in community settings. According to Um et al. (2024), the inconsistency in definitions, data collection methods, and study designs across various research makes it difficult to compare error rates globally. Many community pharmacies in the Philippines also lack formal error-reporting systems, and there is a fear among pharmacy staff of being judged or penalized for admitting errors (Al-Worafi, 2018). Additionally, methods such as direct observation although reliable are costly and impractical for everyday pharmacy operations. This problem is made worse by the absence of standardized dispensing protocols and nationwide error-tracking systems in the country (Lumanta et al., 2023). Addressing these challenges would require the development of clear definitions for dispensing errors, user-friendly reporting tools, and a supportive environment that encourages pharmacists to report incidents without fear.

The Role of Pharmacists in Improving Medication Safety

Pharmacists have a crucial role in enhancing medication safety, especially in community settings. Ravi et al. (2022) emphasized the importance of interprofessional collaboration, identifying nurse-pharmacist partnerships as a strategy to improve medication safety for community-dwelling adults. Ngo et al. (2024) demonstrated how pharmacist-led telepharmacy services positively influenced patient medication decisions and safety awareness, showing high patient satisfaction and trust in pharmacists' advice. Sobrevilla et al. (2025) further validated the pharmacist's role through the Residential Medication Management Review (RMMR) program, which reduced medication errors and improved treatment appropriateness for elderly patients. Collectively, these results confirm that pharmacists, whether working independently or in collaboration, play an essential role in preventing medication errors, promoting appropriate medication use, and protecting patient health in the community.

Barriers and Opportunities for Pharmacist Interventions in Community Settings

Pharmacists are well positioned to prevent medication errors, several barriers limit their ability to intervene effectively. Loh et al. (2023) found that although most community pharmacists recommended treatments for self-medication requests, few collected adequate patient data or provided complete counseling, highlighting gaps in pharmaceutical care. Similarly, Bishop et al. (2019) identified opportunities for pharmacist-led antimicrobial stewardship

programs but noted challenges such as lack of structured protocols and collaborative agreements. Despite these limitations, studies like Togonon et al. (2024) showed that targeted training programs, such as smoking cessation counseling, can improve pharmacists' confidence and capacity to deliver specialized services. These results suggest that with the right support, continuous training, and system improvements, community pharmacists can significantly expand their role in promoting patient safety and public health.

Implications for Pharmacy Practice and Future Research

The evidence gathered from these studies points to several important implications for pharmacy practice and future research. First, pharmacy education must place greater emphasis on error prevention strategies, patient assessment, and public health services like smoking cessation and antibiotic stewardship (Togonon et al., 2024; Bishop et al., 2019). The need for standardized error-reporting systems in community pharmacies is also clear, as highlighted by Um et al. (2024) and Lumanta et al. (2023). Future research should focus on developing effective, locally adaptable interventions that reduce dispensing errors and improve medication safety in the Philippine setting. Programs like the RMMR (Sobrevilla et al., 2025) and telepharmacy services (Ngo et al., 2024) should be expanded and evaluated for their long-term effectiveness and cost-efficiency. Strengthening collaboration between pharmacists and other healthcare providers, as suggested by Ravi et al. (2022), can further enhance community pharmacy's role in ensuring safe and rational medicine use.

Conclusion

This peer review consolidates significant evidence on the critical role of pharmacists in mitigating dispensing errors, enhancing medication safety, and implementing effective interventions within Philippine community pharmacy settings. Across the included studies, the prevalence of dispensing errors, ranging from 0.8% to 33.3%, is shown to stem from multiple causes such as illegible prescriptions, similar drug packaging, inadequate patient data collection, and high dispensing workloads (Al-Worafi, 2018; Um et al., 2024; Lumanta et al., 2023). These findings underscore the urgency of improving prescription accuracy, standardizing pharmacy protocols, and reinforcing patient counseling practices.

Medication safety, a cornerstone of pharmacy practice, is further highlighted through evidence of successful pharmacist-led interventions. Localized studies, such as the Residential Medication Management Review (RMMR) in Davao City (Sobrevilla et al., 2025), demonstrated reductions in medication-related problems among the elderly without adding financial burden. Likewise, telepharmacy services from academic institutions like UPCP positively influenced patients' medication knowledge and safety (Ngo et al., 2024). These models prove that scalable and cost-effective strategies can be successfully embedded into Philippine community health systems.

On pharmacist interventions, research confirms that the current level of pharmaceutical care remains inconsistent. For instance, simulated client studies reveal that while pharmacists often dispense treatment, critical aspects such as complete patient assessment, therapeutic planning, and counseling are frequently overlooked (Loh et al., 2023). However, targeted interventions, like smoking cessation training in Davao City, were found to boost pharmacist self-efficacy and service delivery (Togonon et al., 2024), suggesting that capacity-building programs can yield meaningful improvements. Moreover, collaborative practices with other health professionals, such as nurse-pharmacist models, have shown promising results in improving outcomes among community-dwelling adults (Ravi et al., 2022).

In the Philippine context, these findings carry major implications. Pharmacists are accessible and trusted, especially in underserved areas, making them indispensable in addressing the country's public health needs. However, barriers such as limited formal recognition, lack of standardized reporting systems, and insufficient regulatory support still hinder their full integration into primary care. Therefore, it is essential to invest in training, interprofessional collaboration, and policy reforms that empower pharmacists to move beyond product-focused roles and into patient-centered care.

This review has led to several recommendations, such as: establishing national safety protocols and standardizing dispensing error reporting; enhancing pharmacy curricula with patient-centered, practical competencies; encouraging government support for integrating pharmacists into the delivery of Universal Health Care; promoting community-based training and ongoing professional development; and institutionalizing pharmacist-led services like medication reviews and telepharmacy.

By embracing these strategies, community pharmacists in the Philippines can evolve into fully empowered healthcare providers, contributing not only to the safe use of medicines but also to the broader goal of improved health outcomes across the population.

References:

Althubaiti, Alaa. "Information Bias in Health Research: Definition, Pitfalls, and Adjustment Methods." *Journal of Multidisciplinary Healthcare*, vol. 9, no. 1, 4 May 2016, pp. 211–217, pmc.ncbi.nlm.nih.gov/articles/PMC4862344/, https://doi.org/10.2147%2FJMDH.S104807.

Al-worafi YM. DISPENSING ERRORS OBSERVED BY COMMUNITY PHARMACY DISPENSERS IN IBB - YEMEN. Asian Journal of Pharmaceutical and Clinical Research. 2018 Nov 7;11(11):478.

Bishop C, Yacoob Z, Knobloch MJ, Safdar N. Community pharmacy interventions to improve antibiotic stewardship and implications for pharmacy education: A narrative overview. Research in Social and Administrative Pharmacy. 2019 Jun;15(6):627–31.

Catholic University. University Libraries. The Catholic University of America. 2019. Available from: https://libraries.catholic.edu/research-help/how-do-i/google-scholar.html

Drucker, Aaron M., et al. "Research Techniques Made Simple: Assessing Risk of Bias in Systematic Reviews." *Journal of Investigative Dermatology*, vol. 136, no. 11, Nov. 2016, pp. e109–e114, www.sciencedirect.com/science/article/pii/S0022202X16323569, https://doi.org/10.1016/j.jid.2016.08.021.

Hjørland, Birger . "Research Guides: PubMed: Find Research Articles." *Vt.edu*, 2023, guides.lib.vt.edu/pubmed_tips/finding_research_articles.

Loh P, Lee JW, Mahmathi Karuppannan, Siew Siang Chua. Practice of pharmaceutical care by community pharmacists in response to self-medication request for a cough: a simulated client study. BMC Health Services Research [Internet]. 2023 Jun 20;23(1). Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC

Loquias M, Robles Y. Issues and concerns on utilization of the pharmacy workforce in the Philippines migrant pharmacist pharmacy workforce community practice community pharmacy prescription Correspondence. JAASP. 2012;1(2):86–96. Available from: https://www.aaspjournal.org/uploads/155/5955_pdf.pdf

Mae S, Lumanta V, Peit C, Clarito C, Ashley R, Suico O, et al. A Review on the Medication-Related Errors in the Community Pharmacy and its Effect on Patient Safety. International Journal of Research Publication and Reviews [Internet]. 2023;4(1):487–500. Available from: https://ijrpr.com/uploads/V4ISSUE1/IJRPR9367.pdf

Ngo FLU, Garcia KES, Loquias MM, Robles YR, Capule FR. Perceptions of Clients on a University-based Drug Information Service affecting Medication Safety. Acta Medica Philippina [Internet]. 2023 Nov 20 [cited 2024 May 4]; Available from: https://actamedicaphilippina.upm.edu.ph

Ravi P, Pfaff K, Ralph J, Cruz E, Bellaire M, Fontanin G. Nurse-pharmacist collaborations for promoting medication safety among community-dwelling adults: A scoping review. International Journal of Nursing Studies Advances [Internet]. 2022 Dec;4(4):100079. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC11080473/

Sobrevilla IR, Ric J, Sincero JM, Faller EM. Effectiveness of Residential Medication Management Review (RMMR) Program in Selected Nursing Homes of... International Journal of Research Publication and Reviews [Internet]. 2025 May [cited 2025 Jul 8];6(5):17419–37. Available from: https://www.researchgate.net/publication/392364535

Tariq R, Scherbak Y, Vashisht R, Sinha A. Medication dispensing errors and prevention [Internet]. National Library of Medicine. StatPearls Publishing; 2024. Available from: https://www.ncbi.nlm.nih.gov/books/NBK519065/

Togonon AJT, Abacajen VF, Bucalon EU, Enopia JN, Lambungog LM, Letada KSMG, et al. Effectiveness of Smoking Cessation Training in Improving the Capacity of Community Pharmacists to Provide Smoking Cessation Service in Davao City. International Journal of Research Publication and Reviews. 2024 Aug;5(8):248–58.

Um IS, Clough A, Edwin C.K. Tan. Dispensing error rates in pharmacy: A systematic review and meta-analysis. Research in Social and Administrative Pharmacy. 2024 Jan 1;20(1):1–9. https://doi.org/10.1016/j.sapharm.2023.10.003

University of Findlay. The Role of Pharmacists in Healthcare Systems | University of Findlay [Internet]. pharmdonline.findlay.edu. 2023. Available from: https://pharmdonline.findlay.edu/blog/role-pharmacists-healthcare-systems

van Hoorn, Ralph, et al. "The Development of PubMed Search Strategies for Patient Preferences for Treatment Outcomes." *BMC Medical Research Methodology*, vol. 16, no. 1, 29 July 2016, https://doi.org/10.1186/s12874-016-0192-5.