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Strengthening Medication Safety In Community Pharmacies Practical Pharmacist-Led Strategies For Preventing Medication Errors

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Abstract

Medication errors are an important medication-safety concern and can occur at different stages of the medication-use process. Community pharmacists have an important role in identifying and preventing these errors before medicines reach patients. This narrative review examines practical pharmacist-led strategies for improving medication safety in community pharmacies.

Relevant literature was reviewed to identify major factors associated with medication errors and strategies used to reduce their occurrence. The review focuses on prescription screening and dispensing verification, patient counselling, medication reconciliation and communication, error and near-miss reporting, workflow standardisation, and the use of technology.

The available evidence suggests that medication errors are influenced by several factors, including workload, interruptions, communication problems, organisational processes, and limitations in medication information. Using multiple safety measures can provide more opportunities to identify errors before they reach patients. Patient counselling and medication reconciliation can also involve patients more actively in medication safety, while reporting errors and near misses can help pharmacies identify problems and improve their processes.

Overall, medication safety in community pharmacy is better supported by a combination of practical strategies rather than relying on a single checking step. Further research is needed to evaluate how these strategies can be implemented effectively in different community pharmacy settings.

Keywords; Medication safety; medication errors; community pharmacy; pharmacists; dispensing errors; patient counselling; medication reconciliation

INTRODUCTION

Medication safety is an important component of quality healthcare because medication-related errors can result in preventable harm to patients. Medication errors may occur at different stages of the medication-use process, including prescribing, dispensing, administration, monitoring, and communication between healthcare professionals and patients. Although these errors can occur in any healthcare setting, community pharmacies have an important role in preventing errors because pharmacists are often involved in the final stages before a medicine reaches the patient.

Community pharmacies provide services in an environment where pharmacists must manage prescriptions, medication-related queries, dispensing activities, patient counselling, and communication with other healthcare professionals. These activities can be affected by factors such as workload, interruptions, unclear prescriptions, inadequate communication, environmental conditions, and limitations in available information.

Consequently, medication safety should not depend only on individual vigilance but should also involve practical systems that support pharmacists in identifying and preventing errors.

Pharmacists can contribute to medication-error prevention through several activities. These include systematic prescription screening, appropriate dispensing and verification procedures, patient counselling, medication reconciliation, communication with prescribers, documentation of errors and near misses, and the use of technology with appropriate professional oversight. These strategies address different points at which an error may occur and can provide multiple opportunities to identify an error before it reaches the patient.

Recent evidence indicates that medication errors in community pharmacies are influenced by multiple interacting factors rather than by a single cause. Pharmacist-related, organisational, environmental, workload-related, and technological factors may contribute to the occurrence of errors. This suggests that medication-safety interventions should consider the pharmacy as a system rather than focusing only on individual mistakes.

Despite the importance of pharmacists in medication safety, evidence for individual interventions varies in strength and applicability across different healthcare settings. There is therefore a need to bring together practical pharmacist-led strategies and explain how they can be integrated into routine community-pharmacy practice. A focused narrative review can provide a practical overview of these strategies while highlighting areas where further research is required.

This narrative review therefore examines pharmacist-led strategies for preventing medication errors in community pharmacies, with particular attention to prescription screening and dispensing verification, patient counselling, medication reconciliation and communication, error and near-miss reporting, workflow standardisation, and the appropriate use of technology. The review also considers how these approaches can be combined to create a layered approach to medication safety in community pharmacy practice.

REVIEW OBJECTIVE

The primary objective of this narrative review is to examine pharmacist-led strategies that can help prevent medication errors in community pharmacies.

The specific objectives are:

- To identify common factors associated with medication errors in community pharmacy practice.
- To examine practical pharmacist-led strategies for detecting and preventing medication errors before they reach patients.
- To discuss the role of patient counselling, medication reconciliation, communication, and error reporting in improving medication safety.
- To examine the contribution of workflow standardisation and technology to medication-error prevention.
- To propose a practical, layered approach that integrates multiple pharmacist-led safety strategies within routine community pharmacy practice.

METHODS

Review Design

This study was conducted as a narrative literature review to examine pharmacist-led strategies for preventing medication errors in community pharmacy practice. A narrative approach was selected because the objective was to bring together evidence from different types of studies and provide a practical synthesis of strategies that can be incorporated into routine community pharmacy practice.

Literature Search

Relevant literature was identified through searches of PubMed and other authoritative sources related to medication safety and community pharmacy practice. Search terms included combinations of the following keywords: “medication errors,” “medication safety,” “community pharmacy,” “community pharmacists,” “dispensing errors,” “patient counselling,” “medication reconciliation,” “error reporting,” “pharmacy workflow,” and “technology.”

Reference lists of relevant review articles and primary studies were also examined to identify additional publications directly related to pharmacist-led medication-error prevention.

Selection of Literature

Priority was given to recent literature, particularly publications from 2020 onwards, to reflect current approaches to medication safety and community pharmacy practice. Earlier publications were included when they provided important evidence directly relevant to the review topic or represented influential research on medication-error prevention.

Studies and reports were considered relevant when they addressed medication errors, contributing factors, prevention strategies, pharmacist interventions, patient counselling, medication reconciliation, error reporting, workflow, or technology within community pharmacy or closely related medication-use settings.

Sources that did not directly contribute to the objectives of the review were excluded from the main synthesis.

Evidence Synthesis

The identified literature was examined thematically rather than through statistical meta-analysis. Evidence was grouped according to major pharmacist-led strategies for medication-error prevention. The main themes included prescription screening and dispensing verification, patient counselling, medication reconciliation and communication, error and near-miss reporting, workflow standardisation, and the use of technology.

The findings were then synthesised to identify how these strategies may complement one another and provide multiple opportunities to detect and prevent medication errors before patient harm occurs.

Scope and Limitations of the Method

This review was not designed as a systematic review or meta-analysis. Therefore, it does not claim to provide an exhaustive assessment of all available literature. The purpose was instead to provide a focused and practical synthesis of evidence relevant to pharmacist-led medication safety in community pharmacies.

MEDICATION-ERROR RISK IN COMMUNITY PHARMACY

Community pharmacies represent an important point of contact between patients and the healthcare system. Pharmacists are frequently involved in reviewing prescriptions, selecting and dispensing medicines, providing medication-related information, and counselling patients. These activities create several opportunities to identify medication-related problems before medicines are used by patients. At the same time, the community pharmacy environment can contain multiple factors that increase the possibility of error.

A 2025 systematic review of international evidence identified 73 studies examining medication errors in community pharmacies. The review found considerable variation in the reported types and rates of errors between studies, partly because different definitions, methods, and measurement approaches were used. Most of the available

evidence focused on prescribing and dispensing errors, while comparatively fewer studies examined other stages of the medication-use process. The review also highlighted limited evidence from several geographical regions, indicating that the existing literature does not provide a uniform picture of medication-error occurrence worldwide.

Medication errors in community pharmacy should therefore be viewed as a multifactorial problem. A recent 2026 systematic review and meta-ethnography identified five broad groups of factors associated with medication errors: pharmacist-related factors, the physical and working environment, management and financial factors, organisational and social factors, and challenges associated with digital technologies.

Pharmacist-Related Factors

Pharmacists perform several cognitive and clinical tasks during the dispensing process. Prescription assessment requires attention to medicine selection, dosage, directions, patient-specific factors, and potential problems with the prescribed therapy. Fatigue, insufficient information, competing tasks, communication difficulties, and interruptions may affect the ability to perform these activities consistently.

However, medication safety should not be understood simply as a matter of individual pharmacist performance. A system that relies entirely on continuous individual vigilance may remain vulnerable when workload increases or when several tasks compete for attention. Safety strategies should therefore support pharmacists through structured processes and appropriate checks.

Workload and Environmental Factors

Community pharmacies can be busy environments in which dispensing activities occur alongside patient enquiries, telephone calls, administrative responsibilities, and communication with other healthcare professionals. Interruptions can break the normal sequence of a dispensing task and may increase the possibility that an important verification step is missed.

The 2026 systematic review found that workload, staff shortages, interruptions, and characteristics of the pharmacy environment were among the factors associated with medication errors. These findings support the importance of designing workflows that reduce unnecessary interruptions and provide pharmacists with adequate opportunity to perform safety-critical activities.

Organisational and Technological Factors

Medication safety can also be affected by organisational practices, staffing arrangements, financial pressures, communication within the pharmacy team, and the way technology is incorporated into dispensing processes. Digital systems can assist with prescription processing and information retrieval, but technology does not eliminate the need for professional judgement. Incorrect information, poorly designed alerts, alert overload, or inappropriate reliance on automated processes may introduce additional risks.

Taken together, current evidence suggests that preventing medication errors requires more than identifying individual mistakes. Effective medication safety should address the interaction between people, workflow, the physical environment, organisational processes, and technology. This provides the basis for examining practical pharmacist-led strategies that can introduce multiple safety checks throughout the medication-use process.

PREScription SCREENING AND DISPENSING VERIFICATION

Prescription screening is one of the first opportunities for a pharmacist to identify a medication-related problem before the medicine is supplied to a patient. The pharmacist should assess whether the prescription is appropriate, complete, and understandable, while considering relevant patient-specific information when available.

The dispensing process should not be viewed simply as the physical selection and supply of a medicine. It involves a sequence of activities that includes reviewing the prescription, selecting the appropriate medicine and strength, preparing the product, generating an accurate label, checking the completed prescription, and ensuring that the medicine supplied corresponds with the intended treatment.

Structured Prescription Screening

A structured approach can help pharmacists perform important checks consistently. Depending on the information available, prescription screening may include assessment of the patient's identity, medicine name, strength, dosage form, dose, route, frequency, duration, allergies, relevant clinical information, and potential interactions or contraindications.

Particular attention should be given to prescriptions that contain unclear instructions, unusual doses, similar medicine names, or medicines available in multiple strengths and dosage forms. When information is incomplete

or ambiguous, communication with the prescriber can provide an additional opportunity to prevent an error before dispensing.

Dispensing and Verification

Dispensing verification provides another important safety barrier. The medicine selected should be compared with the prescription and the final labelled product should be checked before it is supplied. Verification should include the medicine name, strength, dosage form, quantity, directions, and other relevant label information.

Evidence from community-pharmacy research demonstrates why these checks are important. A root-cause analysis of medication errors in Danish community pharmacies identified transcription problems, similarities in medicine names or packaging, misleading presentation of strength or dosage information, inadequate control of the prescription label and medicine, and interruptions as contributing factors.

These findings suggest that effective verification should be designed to address predictable sources of error rather than relying solely on memory or experience. For example, medicines with similar names or packaging may require deliberate attention during selection and final checking.

Reducing Interruptions During Safety-Critical Tasks

Interruptions can interfere with the sequence of dispensing activities and may increase the likelihood of an important checking step being missed. Community pharmacies can therefore consider practical measures such as defining periods of reduced interruption during prescription processing, separating administrative tasks from dispensing activities where possible, and ensuring that safety-critical checks are completed without unnecessary distractions.

Independent or Layered Checking

Where staffing and workflow allow, an additional check by another appropriately trained team member may provide another opportunity to identify discrepancies. However, simply adding another person to the process does not automatically guarantee safety. The checking process should be structured and should involve an actual comparison between the prescription, the selected medicine, and the final labelled product.

Overall, prescription screening and dispensing verification should function as complementary safety barriers. A structured process can help pharmacists identify

prescribing problems, selection errors, labelling discrepancies, and other potential medication errors before the medicine reaches the patient.

PATIENT COUNSELLING AS A MEDICATION-SAFETY CHECK

Patient counselling is an important part of community pharmacy practice and can provide an additional opportunity to identify medication errors. During counselling, the pharmacist communicates with the patient about the medicine and can confirm whether the patient has received the correct medicine and understands how it should be used.

An early study by Kuyper showed the potential value of counselling in detecting prescription errors. In that study, 323 medication mistakes were reported, of which 286 (89%) were detected during patient counselling and corrected before the patients left the pharmacy. Although this was an older study and was conducted in a specific pharmacy setting, it demonstrates how direct interaction with patients can provide an additional safety check after the dispensing process.

Confirming the Medicine and Instructions

During counselling, pharmacists can ask patients to confirm the purpose of the medicine, how they are expected to take it, and any important instructions they have received. This interaction may help identify differences between the prescription, the dispensed medicine, and the patient's understanding of the treatment.

Counselling is particularly useful when medicines have complicated dosing instructions, multiple strengths or dosage forms, or important precautions. Explaining the treatment in simple language can also help patients recognise whether something appears different from what they were expecting.

Encouraging Patient Participation

Medication safety should not depend only on the pharmacist. Patients can also contribute to the identification of errors when they are encouraged to ask questions and participate in the medication discussion. A systematic review of patient participation in community-pharmacy counselling found that patient knowledge, communication skills, and the pharmacy environment can influence participation during medication-related discussions.

Therefore, pharmacists should create an environment in which patients feel comfortable asking questions or

reporting that a medicine looks different from what they normally receive.

Improving the Quality of Counselling

Counselling practices can vary between pharmacists and pharmacy settings. A systematic review of interventions designed to improve community-pharmacist counselling found that educational meetings, educational materials, outreach, feedback, and guidelines were commonly used approaches. Most of the included studies reported some improvement in counselling practice, although the authors noted limitations in the quality and reporting of the evidence.

This suggests that simply advising pharmacists to provide counselling may not be enough. Pharmacies can support consistent counselling by using simple checklists, standard counselling points, written information when appropriate, and training for pharmacy staff.

Overall, patient counselling should be considered more than a method of providing information. When used as part of the dispensing process, it can provide another opportunity to identify discrepancies, clarify instructions, and involve patients in medication safety.

MEDICATION RECONCILIATION AND COMMUNICATION

Medication reconciliation is a process used to obtain an accurate list of the medicines a patient is taking and compare this information with the medicines that have been prescribed. It can help identify differences such as omitted medicines, duplicate therapy, incorrect doses, or medicines that the patient is no longer taking.

Community pharmacists can contribute to medication reconciliation because they often have regular contact with patients and may have access to information about medicines supplied from the pharmacy. This can be particularly useful for patients who take several medicines or who receive treatment from more than one healthcare professional.

Identifying Medication Discrepancies

During medication reconciliation, the pharmacist can compare the patient's current medication use with the available prescription or medication list. Patients may sometimes continue medicines that have been stopped, take a different dose from the prescribed dose, or use medicines that are not included in the current medication record.

Identifying these differences does not necessarily mean that every difference is an error. The pharmacist should clarify the reason for the difference and communicate with

the prescriber or other relevant healthcare professional when further clarification is required.

Communication Between Healthcare Professionals

Clear communication is important when a medication-related problem is identified. Community pharmacists may need to contact prescribers to clarify an unclear prescription, discuss a potential interaction, or communicate a concern about a patient's medication.

Good communication should be clear, specific, and focused on the medication-related problem. When possible, important changes or recommendations should also be documented so that relevant members of the healthcare team have access to the updated information.

Communication With Patients

Patients are an important source of information during medication reconciliation. Asking patients about all medicines they currently use, including medicines obtained from different healthcare providers, can provide information that may not be available from a single prescription.

Pharmacists can also encourage patients to maintain an updated medication list and bring it when visiting healthcare professionals. This may help improve communication and reduce discrepancies when medicines are changed.

Evidence for Pharmacist Involvement

Evidence from studies of pharmacist-led medication reconciliation suggests that pharmacist involvement can reduce medication discrepancies, particularly around transitions of care. A systematic review and meta-analysis of pharmacist-led medication reconciliation after hospital discharge found benefits for medication discrepancies and some medication-related outcomes, although the effects varied between studies.

For community pharmacy practice, medication reconciliation can therefore be considered an additional safety strategy rather than a replacement for prescription screening and dispensing checks. Combining accurate medication histories with communication between patients, pharmacists, and prescribers may provide additional opportunities to identify and resolve medication-related problems.

Overall, effective medication reconciliation depends on accurate information and good communication. Community pharmacists can contribute by actively checking medication information, clarifying discrepancies, documenting relevant

findings, and communicating concerns to patients and other healthcare professionals.

ERROR AND NEAR-MISS REPORTING

Error and near-miss reporting can help community pharmacies identify problems in their medication-use processes. A near miss occurs when an error is detected and corrected before it reaches the patient. These events can provide useful information about weaknesses in dispensing and other pharmacy procedures.

A simple reporting system can record the type of error, where it occurred, possible contributing factors, and whether the error reached the patient. Reviewing these reports can help pharmacists identify repeated problems and introduce suitable changes.

For example, repeated errors involving similar-looking medicines may lead to changes in medicine storage or additional checking procedures. Similarly, repeated labelling errors may indicate the need to improve the labelling and verification process.

A supportive safety culture is important for effective reporting. Staff should be encouraged to report errors and near misses so that the pharmacy team can learn from them rather than focusing only on individual blame.

Overall, error and near-miss reporting can support continuous improvement by helping pharmacists identify problems, modify unsafe processes, and monitor medication-safety practices.

WORKFLOW STANDARDISATION AND TECHNOLOGY

Standardised pharmacy workflows can help reduce variation in how medicines are processed and checked. A clear sequence for prescription review, medicine selection, labelling, final verification, and counselling can help ensure that important safety steps are not missed.

Pharmacies can use simple checklists and standard operating procedures for frequently performed tasks. These tools can be particularly useful during busy periods or when several staff members are involved in the dispensing process.

Technology can also support medication safety. Electronic prescribing, pharmacy management systems, drug-interaction alerts, barcode systems, and electronic medication records can help pharmacists identify potential problems and improve the accuracy of dispensing.

However, technology should support rather than replace pharmacist judgement. Excessive alerts, incorrect information, or over-reliance on automated systems may create additional risks. Pharmacists therefore need to review alerts and information critically before making clinical decisions.

Overall, combining standardised workflows with appropriate technology can provide additional safety barriers. The most effective approach is likely to involve technology alongside professional checking, rather than depending on either one alone.

A LAYERED APPROACH TO MEDICATION SAFETY

Medication errors can occur at different points in the medication-use process. Therefore, relying on a single checking step may not be sufficient. A layered approach involves using several safety measures so that an error missed at one stage can potentially be identified at another.

In community pharmacy, these layers can include:

- Prescription screening – checking the prescription for unclear or potentially inappropriate information.
- Dispensing verification – confirming the medicine, strength, dosage form, quantity, and label.
- Patient counselling – discussing the medicine with the patient and confirming their understanding.
- Medication reconciliation – comparing the patient's current medicines with available medication information.
- Error and near-miss reporting – identifying recurring problems and improving pharmacy processes.
- Technology and standardised workflows – using appropriate systems and procedures to support consistent checking.

These strategies are not intended to work independently. Together, they can create multiple opportunities to identify medication errors before they cause harm. This approach also shifts medication safety from depending only on individual attention toward improving the overall pharmacy system.

IMPLEMENTATION IN COMMUNITY PHARMACY

The effectiveness of medication-safety strategies depends on how easily they can be incorporated into routine pharmacy practice. Strategies should be practical, easy to

follow, and suitable for the workload and resources of the pharmacy.

Community pharmacies can begin with simple measures such as standardised prescription-checking procedures, clear dispensing workflows, regular patient counselling, and documentation of medication errors and near misses. Staff training can help ensure that these procedures are followed consistently.

Pharmacy managers can also review commonly occurring errors and identify areas that require improvement. Changes such as separating similar-looking medicines, reducing unnecessary interruptions, or introducing additional checks for high-risk medicines may help address specific problems.

Technology can be introduced where appropriate, but its use should be combined with pharmacist oversight. The choice of safety measures should consider the pharmacy's staffing, workload, available resources, and patient population.

Overall, medication safety does not require one complicated intervention. Consistent use of several simple safety practices may provide multiple opportunities to prevent errors during routine community pharmacy work.

DISCUSSION

Medication errors in community pharmacies are influenced by several factors, including workload, interruptions, communication problems, dispensing processes, and organisational practices. The evidence reviewed in this paper suggests that medication safety is therefore better approached through a combination of strategies rather than a single intervention.

Prescription screening and final dispensing checks provide important opportunities to identify errors before medicines reach patients. Patient counselling adds another safety check because patients may identify differences in their medicines or instructions during the discussion with the pharmacist.

Medication reconciliation and communication can be particularly useful when patients have multiple medicines or changes in treatment. Similarly, reporting errors and near misses allows pharmacies to identify recurring problems and improve their processes.

Technology and standardised workflows can further support medication safety, but they should not replace

pharmacist judgement. The available evidence also varies between studies, and differences in pharmacy settings and methods make direct comparison difficult.

Overall, the findings support a practical approach in which pharmacists use several complementary safety measures throughout the dispensing process. Further research, particularly in community-pharmacy settings that are less represented in the existing literature, could help determine which combinations of strategies are most effective in routine practice.

LIMITATIONS OF THE REVIEW

This review has some limitations. First, it was conducted as a narrative review and therefore did not use the detailed search and selection methods required for a systematic review. Some relevant studies may therefore not have been identified.

Second, the available literature differs in study design, definitions of medication errors, pharmacy settings, and methods of measuring errors. This makes direct comparison between studies difficult.

Another limitation is that much of the available evidence comes from specific countries and healthcare systems. Therefore, the findings may not apply equally to every community pharmacy setting.

Despite these limitations, the review brings together practical pharmacist-led strategies that can be considered as part of medication-safety practices in community pharmacies.

CONCLUSION

Medication errors in community pharmacies can occur due to a combination of human, organisational, environmental, and technological factors. Pharmacists have an important role in reducing these risks through regular safety checks and effective communication.

Prescription screening, dispensing verification, patient counselling, medication reconciliation, error reporting, standardised workflows, and appropriate use of technology can provide multiple opportunities to identify and prevent medication errors.

A practical medication-safety approach should focus not only on individual mistakes but also on improving the systems and processes within the pharmacy. Using several simple and complementary safety measures may help create a safer medication-use process and reduce the risk of preventable harm to patients.

Further research is needed to evaluate these strategies in different community pharmacy settings and to identify practical approaches that can be implemented consistently in routine practice.

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