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A Review Of Medication Coordination Between Pharmacists And Nurses In Healthcare Systems

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Abstract

Background

Medication coordination between pharmacists and nurses ensures accurate, safe medication therapy across care continuums, addressing polypharmacy, transitions, and errors in diverse settings amid aging populations and complex pharmacotherapy.

Methods

This review systematically synthesizes empirical studies (quantitative, qualitative, mixed-methods) and reviews on pharmacist-nurse collaboration in medication management, using guiding questions on models, outcomes, and barriers across acute, primary, community, and long-term care settings.

Results

Coordination reduces medication discrepancies (e.g., 40% in hospitals), adverse events, readmissions, and improves adherence, disease control, workflow efficiency via models like ward-embedded pharmacists, reconciliation, and shared tools; barriers include communication gaps, role ambiguity, workloads.

Conclusions

Strengthening pharmacist-nurse partnerships through education, standardized processes, technology, and policy enhances safety and outcomes; future research needs longitudinal trials and global comparisons.

Keywords Pharmacist-nurse collaboration, Medication reconciliation, Interprofessional coordination, Adverse drug events, Polypharmacy management, Patient safety outcomes, Workflow efficiency, Chronic disease control.

Introduction

Medication coordination between pharmacists and nurses refers to the systematic, deliberate processes through which these two professions collaboratively ensure that medication therapy is accurate, appropriate, timely, and safe across the continuum of care, encompassing prescribing support, verification, preparation, administration, monitoring, and patient education activities within diverse healthcare settings. It involves not only technical tasks such as medication reconciliation, review of orders, and double-checking high-risk drugs, but also shared clinical reasoning, bidirectional communication, and joint decision-making to align pharmacotherapy plans with patients' clinical status, preferences, and care goals. Conceptually, medication coordination integrates elements of medication management, continuity of care, and patient-centered care, using structures such as collaborative practice agreements, shared electronic health records, and standardized communication tools to reduce fragmentation and information gaps. In practice, nurse–pharmacist coordination can take multiple forms, but all share the aim of preventing medication errors, optimizing therapy, enhancing adherence, and ensuring that therapeutic plans remain coherent as patients move between providers and settings. Evidence from acute and community care indicates that such coordinated models improve disease control, reduce adverse drug events and hospitalizations, shorten waiting times for physicians, and support self-management among adults with chronic conditions, underscoring medication coordination as a core mechanism through which interprofessional practice translates into tangible patient benefits (Ravi et al., 2022).

Interprofessional collaboration between pharmacists and nurses is central to medication coordination because effective communication, mutual role clarity, and shared responsibility directly influence medication safety, workflow efficiency, and patient outcomes. High-quality pharmacist–nurse communication supports accurate medication reconciliation at admission and discharge, enabling early detection and resolution of unintentional discrepancies before they cause harm, with studies showing that nurse–pharmacist-led reconciliation processes avert large numbers of potentially harmful events in a cost-effective manner. In routine care, nurses' continuous bedside presence and real-time assessment of patient responses complement pharmacists' expertise in pharmacokinetics, interactions, dosing, and deprescribing, allowing the team to identify emerging adverse effects, non-adherence, or practical barriers and rapidly adjust therapy. Communication structures such as standardized handover protocols, interdisciplinary ward rounds, and shared documentation platforms support smoother workflows, reduce duplication, and streamline verification and dispensing processes, which in turn decrease delays in administration and reduce interruptions and workarounds that can precipitate errors. Beyond error prevention, collaborative pharmacist–nurse partnerships have been associated with improved control of chronic conditions, higher medication adherence, better functional outcomes in community-dwelling older adults, and greater patient satisfaction, reflecting how coordinated medication management aligns treatment plans with patient capabilities and preferences. However, qualitative research indicates that when communication is fragmented, roles are poorly defined, or hierarchies inhibit open dialogue, responsibilities for medication safety become blurred, contributing to missed discrepancies, inefficient workflows, and suboptimal patient experiences, highlighting the need for leadership and organizational support to sustain effective pharmacist–nurse collaboration (Feldman et al., 2012).

The rationale for reviewing medication coordination between pharmacists and nurses is rooted in converging global trends, including an aging population with rising multimorbidity, escalating rates of polypharmacy, increasing complexity of pharmacotherapy, and rapid technological change in health information systems, all of which amplify both the importance and the vulnerability of medication processes. Older adults frequently receive five or more medications, often from multiple prescribers, and face heightened risks of drug–drug interactions, inappropriate prescribing, and adherence challenges,

making coordinated, team-based medication review and deprescribing strategies essential; nurses and pharmacists are key stakeholders in identifying problematic polypharmacy, implementing reconciliation, and supporting patients in daily medication management. At the same time, healthcare systems are under pressure to reduce hospital readmissions, prevent avoidable adverse drug events, and improve chronic disease control, leading to the proliferation of collaborative care models where nurse–pharmacist partnerships are explicitly deployed to enhance medication safety and continuity across transitions of care and in community settings. Technological advances offer new mechanisms for real-time information exchange and joint monitoring, but also introduce novel coordination challenges related to interoperability, alert burden, and workflow integration that particularly affect how nurses and pharmacists communicate around medication issues. Recent scoping and systematic reviews indicate that although there is growing evidence of benefit from nurse–pharmacist collaboration on outcomes like adverse event reduction, improved adherence, and better disease control, research remains fragmented by setting and model, with gaps in community care, long-term care, and low-resource environments, and limited understanding of implementation barriers and facilitators. In this context, a focused synthesis on medication coordination between pharmacists and nurses can clarify conceptual definitions, map existing collaboration models, identify outcome patterns, and illuminate system-level, organizational, and professional factors that enable or hinder effective coordination, thereby informing practice, education, and policy directions in contemporary healthcare systems facing complex medication-related risks (Ravi et al., 2022).

The objective of this review is to systematically examine and synthesize the evidence on how pharmacists and nurses coordinate medication-related activities across healthcare systems, with particular attention to the structures, processes, and outcomes of their collaboration in different care contexts. Specifically, the review will address the following guiding questions: (1) How is medication coordination between pharmacists and nurses conceptualized and operationalized in the literature, including definitions, core components, and theoretical frameworks? (2) What models and mechanisms of pharmacist–nurse medication coordination has been implemented in various settings and what roles do each profession assume within these models? (3) What are the documented impacts of pharmacist–nurse coordination on medication safety outcomes (e.g., medication discrepancies, adverse drug events, high-risk medication management), clinical outcomes (e.g., disease control, functional status, readmissions), workflow and efficiency metrics (e.g., timeliness of administration, workload, task duplication), and patient-reported outcomes (e.g., satisfaction, self-management, adherence)? (4) What barriers and facilitators affect effective coordination, including professional, organizational, technological, educational, and policy-level determinants, and what strategies have been proposed or evaluated to strengthen pharmacist–nurse collaboration around medications? The scope of the review will encompass empirical studies (quantitative, qualitative, and mixed-methods) and review articles that explicitly examine collaboration, communication, or coordinated processes between pharmacists and nurses in relation to medication management, including reconciliation, review, prescribing support, dispensing, administration support, monitoring, and patient education. All major healthcare settings will be considered, from acute care hospitals and emergency departments to primary care, community health centers, home health, and long-term care facilities, as well as transitional care programs that bridge these environments, with no restriction on patient age but particular interest in high-risk populations such as older adults with polypharmacy and patients with chronic diseases. The professions of focus will be licensed pharmacists (including clinical and community pharmacists) and registered or licensed nurses (including community, primary care, and specialist nurses); studies limited solely to physician–pharmacist or nurse–physician interactions without a defined pharmacist–nurse component will be excluded, as will interventions where medication coordination is not clearly described. By delineating this scope and set of guiding questions, the review aims to produce a comprehensive, practice-oriented synthesis that can guide interprofessional education, inform the design of collaborative medication management models, and support policy initiatives aimed at leveraging pharmacist–nurse partnerships to improve medication safety and patient outcomes in contemporary healthcare systems (Cheng et al., 2023).

Conceptual Background

Medication coordination between pharmacists and nurses can be conceptualized as a structured, collaborative process that ensures the safe, effective, and continuous use of medicines across the patient care trajectory, encompassing prescribing, dispensing, administration, and ongoing monitoring within an interprofessional care model. Within this process, coordination is underpinned by theoretical frameworks such as the Continuity of Care Model and the Interprofessional Collaborative Practice Framework, both of which emphasize patient-centeredness, shared goals, role clarity, and information continuity across settings and professions. The Continuity of Care perspective frames medication management as a longitudinal responsibility that spans transitions between primary care, hospital, community, and home, requiring mechanisms such as medication reconciliation, shared care plans, and standardized transfer-of-care documentation to reduce fragmentation and prevent drug-related problems. In parallel, interprofessional collaborative practice frameworks highlight the importance of mutually negotiated care plans, shared decision-making, and collective accountability for medication outcomes, recognizing pharmacists and nurses as core actors who combine pharmacotherapeutic expertise with continuous bedside assessment to achieve safer prescribing, dosing, and monitoring. Contemporary models of team-based medication management further extend these frameworks by embedding pharmacists into multidisciplinary teams and chronic disease pathways, where they work in tandem with nurses through joint assessment, coordination, and evaluation phases to align pharmacotherapy optimization with nursing-led adherence support and patient education, thereby operationalizing medication coordination as a cyclical, learning-oriented process rather than a series of isolated tasks (Kobrai-Abkenar et al., 2024).

Within coordinated medication systems, pharmacists and nurses occupy complementary but distinct roles that span the medication-use continuum, from the initial therapeutic decision to long-term follow-up and deprescribing. Pharmacists traditionally assume responsibility for evaluating prescriptions for clinical and technical appropriateness, identifying potential drug–drug interactions, contraindications, dosing errors, and therapeutic duplications, and performing structured medication reviews and reconciliation, particularly at admission, discharge, and other transitions of care. In many advanced practice and collaborative care models, pharmacists also engage in protocol-driven or collaborative prescribing, therapeutic drug monitoring, and pharmacokinetic dosing, working closely with nurses to tailor regimens to organ function, comorbidities, and patient-specific risks such as polypharmacy or high-alert medications. Nurses, conversely, are primarily responsible for the preparation and administration of medications, real-time monitoring of therapeutic and adverse effects at the bedside, and the continuous assessment of patient status, adherence, and capacity to manage complex regimens in everyday life. They translate pharmacotherapeutic plans into practice through activities such as dose scheduling, infusion management, patient and caregiver education, and the early identification of non-adherence, deterioration, or adverse drug events, frequently functioning as the first point of contact for patients and families. When medication coordination is effective, these roles intersect in shared activities where pharmacists focus on optimizing therapy while nurses ensure that regimens are understandable, feasible, and integrated into broader care and self-management plans, thereby reducing preventable harm and improving clinical outcomes (A. Thürmann, 2016).

Communication pathways are the operational backbone of pharmacist–nurse medication coordination, determining how information about prescriptions, changes, and patient responses flows within and between care settings. Verbal communication remains central, occurring during bedside encounters, informal corridor discussions, telephone calls, and structured interactions such as ward rounds, multidisciplinary team meetings, or case conferences where pharmacists and nurses jointly review medication charts, clarify orders, and negotiate adjustments in real time. Written communication continues to play a critical role through medication charts, nursing notes, pharmacist progress notes, discharge summaries, and standardized medication lists, which provide a shared record of indications, dosing histories, monitoring parameters, and documented adverse reactions that guide both professions in ongoing care. Increasingly, electronic communication platforms enable pharmacists to annotate prescriptions, flag potential safety issues, and document recommendations that nurses can view at the point of administration, while also

capturing administration times, omissions, and patient refusals for pharmacists to review. Telehealth modalities and secure messaging systems further extend these pathways to community and home-based care, allowing community pharmacists and nurses to exchange information on adherence, refill patterns, and emerging problems, and to coordinate interventions such as medication packaging, dose simplification, or home visits. The literature indicates that communication is most effective when it is bidirectional, timely, and embedded in formal structures because these mechanisms provide predictable opportunities for pharmacists and nurses to align perceptions of patient needs, clarify responsibilities, and rapidly respond to high-risk situations or complex regimens (Romero-Ventosa et al., 2016).

Medication coordination between pharmacists and nurses is also shaped by a broader regulatory and policy context that defines expectations for collaboration, documentation, and safety practices across health systems. At the international level, initiatives such as the WHO Global Patient Safety Challenge "Medication Without Harm" emphasize system-level strategies that depend on interprofessional teamwork and clearly delineated roles for pharmacists and nurses in medication reconciliation, high-alert medication management, and patient counseling. WHO guidance on polypharmacy explicitly calls for shared responsibility among physicians, pharmacists, and nurses in developing medication management plans, reviewing complex regimens, and integrating education on safe prescribing and administration into professional curricula, reinforcing the expectation that medication coordination is an interprofessional, not solitary, function. Professional and accreditation bodies, including the Joint Commission and organizations such as the Institute for Safe Medication Practices (ISMP), issue standards and safety alerts on topics like medication reconciliation, labeling, storage, and high-alert drug protocols, which typically assign pharmacists a lead role in designing and reviewing medication-use processes while requiring nursing engagement in administration policies, double-check procedures, and incident reporting. National and regional guidelines, such as "guiding principles to achieve continuity in medication management" and frameworks for interprofessional team-based care in community settings, formalize expectations that pharmacists and nurses collaborate in performing medication reconciliation, sharing medication lists with patients and carers, and participating in team-based chronic disease management and follow-up. In many jurisdictions, scope-of-practice regulations and collaborative practice agreements further enable or constrain the extent to which pharmacists can adjust therapy or order laboratory tests and the degree to which nurses can titrate medications according to protocols, thereby directly influencing how coordination unfolds in practice and highlighting the need for aligned policies that promote, rather than fragment, pharmacist–nurse teamwork in medication management (Ravi et al., 2022).

Overview of Interprofessional Collaboration in Medication Management

Interprofessional collaboration in medication management represents a fundamental shift from historically fragmented, discipline-specific workflows toward integrated, team-based approaches that treat safe and effective medication use as a shared responsibility across professions, particularly between pharmacists and nurses. In traditional healthcare systems, pharmacists were largely confined to dispensing and technical verification of prescriptions, while nurses focused on administration and basic monitoring, with limited structured interaction beyond transactional exchanges such as order clarification or stock-related queries. This siloed model often resulted in discontinuities during transitions of care, poor reconciliation of regimens, and delayed identification of adverse drug events, because each professional operated within distinct information "islands" without formal mechanisms for joint decision-making or continuous feedback. Over time, growing recognition of the high burden of medication-related harm has driven policy and accreditation bodies to explicitly embed collaboration indicators into medication-management standards, thereby institutionalizing interprofessional practice as a core component of safe care delivery (A. Thürmann, 2016).

The historical evolution of interprofessional collaboration in medication management can be traced from largely hierarchical, physician-centered models to more distributed, team-based frameworks in which pharmacists and nurses function as complementary experts in medication safety, education, and monitoring.

Early models emphasized a linear, sequential workflow: physicians prescribed, pharmacists dispensed, and nurses administered, with minimal formal coordination or shared accountability for outcomes. As chronic diseases, polypharmacy, and hospital-to-home transitions became increasingly prevalent, this fragmented approach proved inadequate for preventing errors, optimizing adherence, and ensuring continuity, prompting calls to "break down silos" and redesign care around collaborative practice agreements and shared governance structures. By the late twentieth and early twenty-first centuries, pilot programs in primary care, acute care, and community settings began to formalize nurse–pharmacist dyads, co-located clinics, and shared-decision-making protocols, particularly for conditions such as diabetes, hypertension, and heart failure, where frequent medication adjustments and patient education are critical. These initiatives highlighted that overlapping competencies in patient assessment, medication review, and therapeutic monitoring could be leveraged synergistically when roles were clearly delineated and communication pathways were structured rather than ad hoc (Fahd Sughayer Alshammari & Alia Salman Sunaytan Alshammari, 2024).

Within contemporary healthcare systems, several collaborative practice models have emerged as key vehicles for pharmacist–nurse coordination in medication management, including team-based care, shared decision-making, and multidisciplinary rounds. Team-based care reconfigures medication management as a collective activity in which pharmacists contribute expertise in pharmacotherapy, dosing, interactions, and guideline-based optimization, while nurses contribute insights into patient-reported symptoms, adherence barriers, and functional status, thereby enabling more holistic medication reviews and individualized regimens. Shared decision-making frameworks further extend this integration by involving both professionals in joint discussions with patients about treatment goals, risk–benefit trade-offs, and regimen simplification, which is especially valuable in complex polypharmacy and end-of-life care where preferences and safety must be balanced. Multidisciplinary rounds have become a well-documented mechanism for real-time interprofessional coordination, with pharmacists embedded in daily rounds to review orders, flag potential errors, and recommend alternatives, while nurses provide bedside context on administration challenges, response to therapy, and patient tolerance. Studies of such integrated rounds report consistent reductions in medication discrepancies, prescribing errors, and adverse drug events, underscoring that the physical and temporal co-location of pharmacists, nurses, and physicians strengthens alignment and reduces the "handoff" gaps that often precipitate harm (Ahmed Yahya Mohsen Alrashah & Saleh Mahdi Alsulimaan, 2025).

The impact of interprofessional collaboration on patient care is most clearly evident in the domains of medication safety, adherence, and error reduction, where structured pharmacist–nurse partnerships have been associated with measurable improvements in clinical and economic outcomes. In acute-care settings, nurse–pharmacist collaborations focused on medication reconciliation, high-risk medication monitoring, and discharge planning have been linked to fewer preventable adverse drug events, shorter lengths of stay, and reduced readmission rates, particularly for patients transitioning from hospital to home or long-term care. Community-based nurse–pharmacist collaborations similarly demonstrate benefits, including improved chronic disease control, earlier identification of medication-related problems, and decreased hospitalizations, by combining pharmacists' technical expertise with nurses' longitudinal relationships and home-based assessments. Quantitative syntheses indicate that structured interprofessional models correlate with lower prescribing and administration errors, fewer medication discrepancies at transitions, and higher rates of incident reporting, suggesting that collaboration not only reduces harm but also strengthens organizational learning. Qualitative work further emphasizes that clear role delineation, mutual trust, and frequent, structured communication are critical enablers, whereas ambiguous responsibilities, time pressure, and cultural silos can undermine even well-designed collaborative frameworks (Dib & Belrhiti, 2025).

From a systems perspective, interprofessional collaboration in medication management is increasingly conceptualized as part of broader "collaborative care ecosystems" in which pharmacists and nurses are integral nodes in networks that span primary care, acute care, and community services. In such ecosystems,

pharmacists often serve as medication-management hubs, coordinating with nurses, physicians, and other providers to align treatment plans, reconcile regimens, and implement deprescribing or regimen-simplification strategies, while nurses act as continuity anchors who monitor response, reinforce education, and escalate concerns in real time. Health-information-technology tools further amplify the value of collaboration by enabling timely access to up-to-date medication lists, laboratory data, and clinical notes across disciplines. Evidence suggests that when these technological and relational elements are combined, interprofessional teams can more effectively prevent diagnostic and therapeutic errors, enhance continuity, and reduce avoidable harm, reinforcing the argument that medication safety is not the sole responsibility of any single profession but a shared function of well-coordinated, interprofessional systems. For your review, this evolving landscape provides a strong rationale for positioning pharmacist–nurse coordination as a central pillar of modern medication-management strategies rather than an ancillary or ad hoc activity (Ye & Bronstein, 2025).

Coordination Across Medication Process Stages

At the prescription and order verification stage, nurses play a pivotal intermediary role by transcribing, clarifying, and electronically entering prescriber orders while simultaneously ensuring that the clinical context, vital signs, laboratory data, and nursing assessments are accurately communicated to pharmacists for safe verification and dispensing, particularly in complex cases such as polypharmacy, renal or hepatic impairment, and high-risk medications like anticoagulants and insulin, where incomplete or ambiguous orders can rapidly translate into patient harm if not intercepted early. Evidence from nurse–pharmacist collaboration studies shows that systematic triadic communication among prescribers, nurses, and pharmacists reduces ambiguity, duplicate therapies, contraindicated combinations, and inappropriate prescriptions, with pharmacists frequently identifying errors and recommending dose adjustments, monitoring parameters, and therapeutic alternatives that nurses then operationalize at the bedside. Pharmacists, acting as the final professional "gatekeepers" before a medication order reaches the patient, verify indications, dosing, interactions, allergies, and formulation suitability, while nurses contribute crucial real-time information about patient status (e.g., level of consciousness, swallowing ability, infusion access), and both professions collaborate during medication reconciliation at admission, transfer, and discharge to resolve discrepancies and communicate any intentional changes to the wider team. Best practices in this stage include embedding pharmacists in ward rounds, implementing verification nurse roles who work in close liaison with prescribers and pharmacists to check orders before execution, and establishing clear escalation pathways for resolving questionable orders, which together create a culture where nurses feel supported to question prescriptions and pharmacists are empowered to contact prescribers directly, resulting in fewer order-related errors and stronger shared accountability for pharmacotherapeutic outcomes (Zhu et al., 2016).

During dispensing and supply chain management, coordinated collaboration between pharmacists and nurses is essential to ensure that ordered medications are safely prepared, accurately dispensed, and reliably available at the point of care, with nurses providing real-time feedback on utilization patterns, emergent clinical needs, and bedside interruptions to drug therapy that inform pharmacy inventory decisions and stocking strategies on wards, automated dispensing cabinets, and satellite pharmacies. Pharmacists lead formulary management, procurement, and shortage mitigation, but effective systems explicitly integrate nursing input when developing substitution protocols, rationing strategies, and allocation criteria during drug shortages, allowing front-line staff to anticipate changes, minimize therapy delays, and maintain continuity of care even when preferred agents are unavailable, as highlighted during the coronavirus disease 2019 pandemic where structured shortage response models stressed multidisciplinary communication to operationalize alternatives across the health system. Studies on formulary management show that comprehensive systems with expanded pharmacist authority for therapeutic interchange improve formulary compliance and reduce labor associated with processing nonformulary requests; however, success in practice depends on nurses being informed, trained, and engaged so that bedside administration, documentation, and monitoring accurately reflect any brand, strength, or agent substitutions and prevent

confusion that could lead to administration errors. Best practices at this stage include establishing joint pharmacy–nursing committees or working groups for formulary and shortage decisions, standardizing communication templates when shortages or substitutions occur, integrating alerts and guidance into electronic medication administration records, and using interdisciplinary huddles to highlight critical medications at risk, thereby aligning pharmacy logistics with nursing workflows and ensuring that safety policies on high-alert drugs, storage, and labeling are consistently implemented where patients actually receive therapy (Tariq et al., 2024).

At the administration and monitoring stage, nurses are the final executors of medication therapy at the bedside and rely heavily on pharmacist expertise to optimize timing, rates of administration, compatibility, and monitoring plans, while pharmacists depend on nurses' continuous observations and vital sign assessments to detect early adverse drug reactions, treatment failures, and opportunities for deprescribing or dose adjustment. Interprofessional guidance emphasizes the "rights" of medication administration which nurses operationalize within complex clinical environments, but effective adherence to these principles is strengthened when pharmacists and nurses jointly design protocols, double-check processes, and electronic decision support that flag high-risk situations such as narrow therapeutic index drugs, renal dose adjustments, or look-alike/sound-alike medications, with nurses promptly communicating any practical barriers or near misses observed in daily practice. Studies of interdisciplinary cooperation show that nurses value pharmacists' involvement in medication reviews, monitoring plans, and interpretation of laboratory results, and that collaborative relationships encourage nurses to report suspected adverse drug events, question dosing, and request alternative formulations (e.g., liquid versus tablet) when they notice administration difficulties, thereby closing the loop between prescribing intent and actual patient response. Best practices at this stage include embedding pharmacists into clinical teams for high-risk units (e.g., intensive care, oncology), using structured communication tools (such as SBAR) for nurse–pharmacist interactions about adverse effects, maintaining shared monitoring plans in the electronic record that specify who follows which parameter and when, and instituting joint morbidity and mortality reviews or medication safety rounds where nurses and pharmacists analyze administration errors and adverse events together to generate system-level improvements rather than individual blame (Hanson & Haddad, 2023).

In the patient education and discharge phase, coordinated efforts between nurses and pharmacists are crucial to prepare patients and caregivers to safely manage medications at home, particularly during transitions of care when regimen complexity changes and the risk of discrepancies, misunderstandings, and non-adherence is high; here, pharmacists often lead medication reconciliation, review discharge prescriptions for appropriateness, and provide detailed counseling on indications, dosing, side effects, and interactions, while nurses reinforce instructions, contextualize them within overall care plans, and assess patients' readiness and health literacy. Evidence from transition of care programs demonstrates that pharmacist-led or pharmacist-supported discharge interventions reduce medication discrepancies, 30-day readmissions, and emergency visits, but the effectiveness of these programs depends on nurses' active participation in identifying high-risk patients, initiating early discharge planning, documenting education, and ensuring that patients leave the hospital with medications in hand and written information that is understandable and culturally appropriate. Nurse–pharmacist collaborations at discharge frequently involve structured workflows where, for example, pharmacists perform targeted counseling for patients with polypharmacy or chronic disease (such as heart failure or diabetes), while nurses coordinate discharge summaries, arrange follow-up appointments, clarify lifestyle instructions, and use teach-back techniques to verify understanding, with both professions sharing responsibility for communicating any medication changes to primary care providers and community pharmacists to prevent duplication or omission. Best practice recommendations include starting discharge education at admission, using standardized electronic documentation of counseling, integrating pharmacy services into multidisciplinary discharge rounds, scheduling pharmacist or nurse–pharmacist clinics or phone follow-ups after discharge, and ensuring interoperability between inpatient and outpatient electronic systems so that community providers receive

accurate medication lists, all of which strengthen continuity of care and empower patients as active partners in safe medication use beyond the hospital setting (Punatar et al., 2023).

Barriers to Effective Coordination

Communication gaps and hierarchy issues represent a pervasive barrier to effective medication coordination between pharmacists and nurses, as they undermine timely information exchange, collaborative problem-solving, and shared accountability across the medication-use process. Poorly structured communication channels, fragmented handovers, and reliance on asynchronous or indirect messaging can lead to incomplete transfer of clinically relevant information such as dose changes, monitoring parameters, and administration considerations, which increases the risk of medication errors and delays in therapy optimization. Hierarchical cultures in many healthcare systems, where physicians occupy the top of the decision-making pyramid and pharmacists and nurses are positioned lower, often discourage open dialogue and discourage questioning or clarification, particularly from nurses who may feel undervalued or perceive pharmacists as controllers rather than collaborative partners. Qualitative studies have shown that pharmacists sometimes experience skepticism and must first "prove" their expertise to nursing staff and other clinicians, while nurses may receive limited opportunities to participate in medication-related decision-making beyond the administration phase, reinforcing a task-oriented rather than partnership-oriented model of care. These interpersonal and structural communication barriers are compounded by limited pharmacist presence on wards, inconsistent participation in rounds, and absence of standardized communication tools, all of which constrain the development of mutual trust and shared mental models that are crucial for safe, coordinated medication management (Wakob et al., 2023).

Role ambiguity and overlapping responsibilities between pharmacists and nurses further complicate medication coordination, as unclear professional boundaries contribute to duplication of work, gaps in care, and interprofessional tension. In many organizations, pharmacists are expected to provide clinical review, reconciliation, and drug information, whereas nurses are responsible for administration, monitoring, and patient education; however, empirical work on medication management and reconciliation shows that these responsibilities often overlap without clear protocols, with both groups perceiving themselves as accountable for tasks such as verifying medication lists, identifying discrepancies, or counseling patients. Studies of task sharing and medication review have demonstrated that when roles are not explicitly delineated, some critical tasks may be incompletely performed or not clearly owned by either pharmacists or prescribers, forcing nurses to fill gaps informally and increasing the risk of errors. More broadly, research on pharmaceutical care and professional identity indicates that role ambiguity and role conflict can undermine pharmacists' ability to fully enact their clinical responsibilities, while nurses may experience uncertainty in how far they can engage in medication optimization beyond physician orders, leading to cautious behavior and underutilization of each profession's expertise. Without shared understanding of competencies, formal agreements on role boundaries, and interprofessional education that clarifies how pharmacists' and nurses' contributions are complementary rather than competing, role ambiguity becomes a structural barrier that weakens coordination, mutual respect, and accountability across the medication-use system (Moecker et al., 2022).

Time constraints and workload pressure impose substantial practical barriers to pharmacist–nurse coordination, as high patient volumes, staffing shortages, and administrative burdens leave limited time for joint discussions, bedside collaboration, or proactive medication review. Both pharmacists and nurses frequently describe intense workload and competing priorities as reasons for their inability to attend shared rounds, respond promptly to queries, or engage in detailed counseling and double-checking processes, resulting in coordination that is reactive and fragmented rather than planned and continuous. The introduction of electronic documentation and regulatory requirements, while intended to enhance safety, has in many settings increased clinicians' documentation time and cognitive load, with evidence that electronic health record (EHR) use can increase time spent on clinical review and documentation and contribute to burnout, thus further eroding capacity for interprofessional engagement. Under such

conditions, both professions may resort to workarounds to cope with workload, which can bypass established safety mechanisms and reduce transparency of medication decisions for other team members. Over time, chronic time pressure and understaffing can normalize minimal communication, decrease opportunities for relationship-building between pharmacists and nurses, and discourage participation in collaborative quality improvement initiatives related to medication safety (Kobrai-Abkenar et al., 2024).

Technological limitations, particularly the lack of interoperability and integration in EHR and pharmacy systems, significantly hinder seamless medication coordination between pharmacists and nurses by fragmenting the medication information environment. Interoperability challenges, information silos between hospital, community, and primary care systems, and heterogeneous vendor platforms mean that pharmacists and nurses often work with incomplete, outdated, or inconsistently formatted medication data, increasing the risk of transcription errors, duplication, and overlooked contraindications during transitions of care. Even within single institutions, EHRs may lack embedded, user-friendly tools for real-time interdisciplinary communication or structured pharmacist–nurse documentation around medication plans, forcing clinicians to rely on workarounds such as free-text notes, separate messaging systems, or paper-based communication that are not easily visible to all team members. Studies of digital information ecosystems in healthcare highlight that while EHRs can centralize data, they often provide insufficient cognitive support and do not effectively align information flows with the complex coordination needs of interprofessional teams, thereby adding digital workload and contributing to delays or miscommunication around medication orders and administration. Moreover, variability in access rights and system literacy between pharmacists and nurses may further limit the capacity of each profession to fully leverage available digital tools, resulting in underuse of clinical decision support and inconsistent documentation that weakens shared situational awareness and continuity of medication-related information (Chen et al., 2024).

Educational and training deficits also pose important barriers to effective pharmacist–nurse coordination in medication management, as many practitioners receive limited formal preparation for interprofessional collaboration, communication, and shared decision-making. Traditional health professions curricula often emphasize profession-specific knowledge and skills, with relatively few structured interprofessional education activities that bring pharmacy and nursing students together to practice joint medication review, reconciliation, and patient counseling, leaving graduates unfamiliar with each other's competencies and typical workflows. In practice settings, continuing professional development may focus on clinical or technical content rather than relational and teamwork skills, which means that pharmacists and nurses may lack training in conflict resolution, feedback techniques, or structured communication tools (such as SBAR) that facilitate safe and efficient medication-related dialogue. Furthermore, deficits in cross-disciplinary understanding can sustain stereotypes and reduce appreciation of the added value each profession brings to medication safety and optimization. Without systematic investment in interprofessional education, simulation-based training, and shared reflective practice, these educational gaps persist across career stages, undermining efforts to embed a culture of collaborative medication management in daily routines (Rn) et al., 2024).

Organizational culture and leadership strongly shape the extent to which pharmacist–nurse coordination around medications is supported or obstructed, with unsupportive cultures acting as a pervasive barrier even when individual professionals are motivated to collaborate. In settings where the organizational culture is characterized by rigid professional hierarchies, low psychological safety, and a narrow focus on productivity, pharmacists and nurses may feel discouraged from raising concerns about prescriptions, reporting near misses, or suggesting changes to established routines, thereby limiting open discussion of medication-related risks and improvement opportunities. Leadership that prioritizes cost containment or throughput over quality and interprofessional collaboration may fail to allocate sufficient resources for pharmacist presence on wards, joint rounds, or shared quality initiatives, and may not establish clear policies or performance indicators for collaborative medication management. Conversely, the absence of visible leadership support for interprofessional practice can result in isolated pilot projects that depend on individual champions rather than sustainable system-level changes, leaving pharmacists and nurses to

negotiate collaboration informally within entrenched structures that favor siloed work. Organizational cultures that do not recognize or reward collaborative behaviors, such as shared decision-making, mutual support, and cross-disciplinary problem-solving, inadvertently reinforce fragmented practice patterns in which medication coordination is viewed as optional or secondary rather than as a core component of safe, high-quality care (Wakob et al., 2023).

Evidence from Different Healthcare Settings

In acute hospital settings, including intensive care units (ICUs), surgical wards, and oncology units, coordination between pharmacists and nurses is pivotal because patients are exposed to polypharmacy, frequent therapy changes, and high-risk medications, all of which heighten the risk of medication discrepancies and adverse drug events (ADEs). Surgical wards, in particular, have been identified as environments with a higher incidence of medication errors than internal medicine wards, partly because surgeons may feel less confident in pharmacotherapy decisions, making pharmacist–nurse collaboration around medication reconciliation and discharge planning especially important. A study of surgical ICU patients reported an average of more than seven medication discrepancies per patient, underlining the need for structured collaborative processes in which nurses provide real-time clinical and contextual information while pharmacists systematically verify orders, optimize dosing, and reconcile preadmission medications. Collaborative nurse–pharmacist medication reconciliation models at admission and discharge have been shown to detect unintended discrepancies in about 40% of hospitalized patients, with many discrepancies rated as potentially harmful, and the cost of the joint intervention was offset by the prevention of ADEs, demonstrating both clinical and economic value for acute care organizations (Abu Hammour et al., 2022).

In ICUs and oncology units, pharmacists and nurses jointly manage complex regimens involving vasoactive drugs, chemotherapy, immunosuppressants, and high-alert medications, and this interprofessional approach contributes to safer titration, monitoring of organ function, and timely identification of drug–drug interactions. Oncology and critical care protocols often require precise timing, preparation, and administration steps; here, the nurse's continuous bedside presence and the pharmacist's pharmacokinetic and pharmacodynamic expertise combine to reduce dosing errors, infusion incompatibilities, and omissions, particularly during transitions between ICU, step-down, and general wards. Studies of nurse–pharmacist collaboration on medication reconciliation have shown that coordinated history taking (e.g., high-quality home medication lists), shared verification workflows, and joint review of discharge prescriptions can reconcile a substantial proportion of discrepancies before they reach the patient, preventing dozens of potential ADEs per few hundred encounters and improving continuity of pharmacotherapy beyond hospitalization. These findings collectively suggest that embedding pharmacists within acute care teams and formalizing structured communication and feedback loops with nurses (e.g., daily ward rounds, shared checklists, and electronic alerts) are essential strategies to strengthen medication coordination in ICU, surgical, and oncology settings (Feldman et al., 2012).

In primary care and community settings, nurse–pharmacist coordination around medication management is central to chronic disease control, because adults living with conditions such as hypertension, diabetes, and cardiovascular disease frequently face adherence barriers, regimen complexity, and fragmented care across providers. Quality improvement projects in primary healthcare have demonstrated that when nursing teams are actively engaged in identifying adherence barriers, providing education, and implementing evidence-based adherence strategies (e.g., blister packs, pillboxes, regimen simplification), they achieve meaningful improvements in adherence; these efforts are further amplified when pharmacists collaborate to tailor regimens, conduct medication reviews, and reinforce patient counselling. Team-based care interventions in primary care that combine pharmacist-led medication tailoring, nurse-delivered education and follow-up, and technology-enabled reminders (such as automated voice messaging) have been associated with significant improvements in adherence rates and more appropriate therapy adjustments across different chronic disease populations (Oliveira et al., 2024).

Systematic analyses of nurse–pharmacist collaboration in community settings indicate that such partnerships improve disease management, decrease ADEs, and reduce hospitalizations and waiting times to see physicians, particularly among community-dwelling adults with multiple chronic conditions. In these models, community pharmacists often provide services such as home visits, medication reconciliation, regimen simplification, generation of updated medication lists for nurses and prescribers, and patient or caregiver education, while community nurses use this information to monitor clinical status, reinforce self-management skills, and respond promptly to early warning signs of deterioration. Collaborative arrangements have also enabled nurses and pharmacists to jointly address broader determinants of health thereby supporting older adults to maintain functionality and age in place. Despite these benefits, current evidence highlights that role clarity, communication pathways, and avoidance of task duplication remain challenges in some community programs, underscoring the need for clearer protocols, shared documentation systems, and supportive policy frameworks to sustain effective nurse–pharmacist medication coordination in primary care (Ravi et al., 2022).

Long-term care (LTC) facilities represent a setting where pharmacist–nurse coordination is particularly critical, because residents are typically older, frail, and exposed to extensive polypharmacy that predisposes them to drug-related problems (DRPs), functional decline, and hospitalizations. Pharmacist-led medication reviews in LTC homes have been implemented in multiple countries and have consistently been shown to identify large numbers of DRPs, including potentially inappropriate medications, therapeutic duplications, and hazardous drug–drug or drug–disease interactions, which nurses help contextualize through detailed knowledge of residents' symptoms, behaviors, and daily routines. Systematic reviews and primary studies indicate that pharmacist-led or multidisciplinary (pharmacist–nurse–physician) medication reviews can improve the quality of medication use in LTC, reduce potentially inappropriate prescribing, and support deprescribing of unnecessary or harmful agents, especially psychotropics and sedative–hypnotics (Disalvo et al., 2019).

Interdisciplinary models in LTC frequently adopt structured, stepwise review processes in which pharmacists analyze medication profiles, propose recommendations, and then discuss these suggestions with nurses and physicians during case conferences or ward meetings to agree on changes, monitoring plans, and follow-up. Prospective intervention studies have shown that pharmacist-directed medication reviews, combined with active engagement of nurses and physicians, result in numerous clinically relevant medication changes, prevention or resolution of DRPs, and may reduce hospital admissions, falls, and other adverse outcomes, although the magnitude of these effects varies across facilities and study designs. Nurses play a central role in implementing deprescribing plans by monitoring withdrawal effects, tracking behavioral and cognitive changes, and communicating resident or family preferences back to the pharmacist and prescriber, thus enabling a more person-centered approach to rationalizing therapy. Reviews of pharmacist services in nursing homes further support that embedding pharmacists as part of the core interdisciplinary team significantly enhances the appropriateness of drug treatment and is a promising strategy for optimizing medication coordination in LTC (Chao & MacDougall, 2019).

In emergency departments (EDs) and prehospital services, nurse–pharmacist coordination focuses on rapid decision-making, accurate medication histories, and ensuring timely access to critical drugs under conditions of high acuity and time pressure, where even minor errors can have serious consequences. Nurse–pharmacist collaboration on medication reconciliation in ED and other acute admission areas has revealed high rates of unintended discrepancies at the point of hospital entry, and the joint process of history taking, verification, and clarification of ambiguous orders allows many of these discrepancies to be corrected before harm occurs. In some models, designated nurses in each department work closely with pharmacists as part of a ward-based medication safety strategy, with daily interactions aimed at preventing prescribing, transcription, dispensing, and administration errors; this collaboration has been particularly important in isolated or resource-limited facilities with high staff turnover, where standardized processes and shared expertise can mitigate safety risks (Abu Hammour et al., 2022).

Although evidence specific to prehospital environments is less extensive, available data suggest that when pharmacists contribute to protocol development, drug selection, and stock management for emergency medical services, nurses and paramedics benefit from clearer guidelines, better-organized drug supplies, and improved support for complex dosing decisions in the field. Within EDs, pharmacists often assist nurses with real-time verification of high-alert medications, weight-based dosing, compatibility and stability checks for intravenous preparations, and adjustments for organ dysfunction, all of which are critical for safe resuscitation and stabilization. Joint initiatives that integrate pharmacists into emergency care teams, combined with nurse-led triage and continuous monitoring, have the potential to reduce medication errors during transitions from prehospital to in-hospital care, though further rigorous studies are needed to quantify effects on ADEs, process efficiency, and resource utilization in these fast-paced settings (Feldman et al., 2012).

Recommendations and Strategies for Improvement

Enhancing communication channels between pharmacists and nurses is fundamental to optimizing medication coordination in healthcare systems, as poor communication often leads to medication errors, discrepancies, and adverse events that compromise patient safety. Implementing standardized protocols, such as real-time digital tools for order tracking, direct messaging portals, and regular interdisciplinary check-ins, can foster open dialogue, reduce misunderstandings in medication orders, and ensure timely resolution of issues like dose adjustments or refill requests. Moreover, monthly meetings between nursing directors and pharmacy liaisons allow for troubleshooting recurring problems, sharing updates on new medications, and aligning on patient care priorities, ultimately streamlining workflows and enhancing nurse satisfaction by balancing urgency with safety checks. These strategies not only minimize task duplication but also build trust and reciprocity, enabling pharmacists to provide expertise on drug interactions while nurses contribute clinical insights on patient responses (Celio et al., 2018).

Embedding pharmacists directly into clinical wards or nursing units represents a transformative approach to medication coordination, allowing for immediate on-site interventions that alleviate nursing burdens related to medication administration, reconciliation, and error prevention. Ward-embedded pharmacists can handle intravenous and oral medication administration, conduct real-time reviews during rounds, and collaborate on discharge planning, which has been shown to save significant nursing time while preventing errors through proactive identification of discrepancies. This physical proximity facilitates shared decision-making, such as joint verification protocols for high-alert medications, reducing near-miss incidents and improving turnaround times for critical drugs in high-pressure environments like emergency departments or general wards. Furthermore, such integration empowers nurses by offloading non-core tasks, fostering a team culture where pharmacists act as accessible experts for queries on polypharmacy, therapeutic monitoring, and cost-effective alternatives, leading to better patient outcomes like reduced readmissions (Wakob et al., 2023).

Expanding interprofessional education (IPE) programs tailored for pharmacists and nurses is essential for cultivating mutual understanding of roles, improving collaborative competencies, and embedding medication safety practices from training onward. Longitudinal IPE activities, such as simulation-based sessions on medication reconciliation, end-of-life care, and nutrition management, enable students to practice teamwork in realistic scenarios, resulting in higher competency attainment in communication, patient-centered care, and error prevention. These programs should incorporate joint workshops on vital signs techniques, prescription review, and digital tool usage, addressing barriers like role ambiguity and skepticism by highlighting complementary strengths pharmacists' focus on efficacy and access, nurses' emphasis on holistic patient management. Evidence from such initiatives demonstrates reduced medication discrepancies and enhanced self-management skills among patients, with calls for institutional support to scale them across curricula, including policy advocacy for funding and accreditation (Kavanaugh et al., 2023).

Implementing standardized processes for medication reconciliation is a cornerstone strategy, involving systematic steps like obtaining verified histories, documenting regimens, and reconciling at transitions to create accurate administration records and discharge instructions. Pharmacist-nurse dyads excel here, with nurses verifying patient-reported data and pharmacists analyzing interactions or omissions, achieving resolution rates up to 67% in transitions from hospital to home care, significantly higher than controls. These processes reduce nursing and pharmacy while minimizing rehospitalizations through tools like shared electronic lists and handoff protocols during interdisciplinary rounds. Expanding this to ambulatory settings ensures ongoing updates, patient education, and transmission to follow-up providers, tackling polypharmacy risks in chronic care (Barnsteiner, 2008).

Encouraging research and outcome monitoring sustains improvements by evaluating collaboration impacts on metrics like adverse events, adherence, and costs, informing evidence-based refinements. Nurse-pharmacist teams should track interventions via data-driven metrics, such as discrepancy resolutions or hospitalization reductions, using quality improvement initiatives to demonstrate value and secure resources. Barriers like limited presence or funding can be addressed through studies validating models like telepharmacy, which cut hospitalizations by 15%, advocating for policy changes like remuneration for collaborative roles (Ravi et al., 2022).

Future Directions and Research Gaps

The need for longitudinal and intervention studies is critical to establish causality in pharmacist-nurse collaborations' effects on long-term outcomes like sustained adherence, reduced chronic disease exacerbations, and healthcare utilization in diverse populations. Current evidence is nascent, often short-term or descriptive, lacking rigorous randomized trials tracking cohorts over years to quantify benefits like 15% hospitalization drops from telepharmacy or discrepancy resolutions in transitions. Such studies should incorporate patient-centered metrics, economic analyses, and scalability assessments to guide policy (Celio et al., 2018).

Evaluation of digital coordination tools, including AI-driven risk modeling, electronic reconciliation platforms, and telehealth portals, is imperative to harness technology for real-time communication and workflow efficiency. Preliminary data show tools like secure messaging reduce errors by enabling swift cross-verification, but rigorous trials are needed to assess usability, integration barriers, and impacts on equity in underserved areas. Future research should prioritize interoperability standards and cost-benefit analyses (Mamiya & Hirata, 2022).

Assessment of interprofessional competencies remains a gap, with perceptions varying necessitating validated tools for ongoing evaluation in practice. Studies should develop metrics for attitudes, skills like collaborative decision-making, and training impacts, using surveys and observations to inform education (Mamiya & Hirata, 2022).

Global disparities in pharmacist-nurse collaboration frameworks highlight needs for comparative research across systems, addressing variations in roles, resources, and regulations between high- and low-resource settings. While Anglo-American models emphasize ward integration, others lag due to funding or legal barriers, requiring studies on adaptable strategies to reduce inequities in medication safety (Wakob et al., 2023).

Conclusion

This review synthesizes evidence showing that pharmacist-nurse collaboration reduces medication discrepancies, adverse events, and readmissions while optimizing therapy in acute, community, and long-term care. Despite barriers like communication gaps and role ambiguity, strategies such as ward-embedded pharmacists, standardized reconciliation, and enhanced communication tools yield efficiency gains and cost savings. Future efforts should prioritize interprofessional education, digital interoperability, and longitudinal studies to address gaps in low-resource settings and sustain these partnerships.

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