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Collaboration Between Pharmacists and Nurses in Enhancing Patient Compliance and Outcomes

Mohammed Abdulaziz Altamimi [1]*, Abdullah Saud Aldugim[2], Sarah nashi albuqami[3], Mona Mohammed Alzamil[4], Ahmad Omar Alsayeh[5], Hakmah Shabbab Bin Thaali[6], Mnefah hussaine Alharbi [7], Mashael jubayr Alanazi[8] , Nawal Ahmed Jaafari[9] and Shaykhah Mohammed Aldosari[10]

[1] Corresponding Author, Clinical pharmacist, camolezy@gmail.com
[2] Technician pharmacy, Aaldugim@kfmc.med.sa
[3] Pharmacist, Salbuqami@kfmc.med.sa
[4] Pharmacist
[5] Pharmacy, a_alsayeh@yahoo.com
[6] Nurse, Hakmaha123@gmail.com
[7] Nurse, mhusalharbi@kfmc.med.sa
[8] Nurse, monazi@kfmc.med.sa
[9] Nurse, N3wal_1414@hotmail.com
[10] Patient Care Technician,Smaldosari@kfmc.med.sa, KFMC, Riyadh, SA

1.2 **Abstract**

Pharmacist-nurse collaboration is a key variable for effective health delivery to ensure optimal patient care and outcomes. Collaboration is defined as a process by which pharmacists and nurses communicate and make joint decisions to be implemented for the benefit of patients and the healthcare system. A patient-centred model for collaboration highlights the complementary roles of pharmacists and nurses in assessing patient needs and delivering care. Pharmacists assess needs related to drug therapy and medicines management while nurses provide a broad bio-psychosocial assessment of needs, coordinate care and advocate for patients using the whole-health perspective. Effects of collaboration include improved patient compliance, smooth transitions in care, avoidance of adverse drug reaction or interaction, effective chronic disease management, provision of health promotion and greater medication adherence (Kristeller et al., 2017) (Labrador Barba et al., 2017). Continuous teamwork enables pharmacists and nurses to deliver more sustainable improvements in patient health

1.3 **Keywords:**

Collaboration Patient Compliance Pharmacists Nurses Outcomes Interprofessional Teamwork Medication Management Care Coordination

1.4 **1. Introduction**

The increasing complexity of patient care necessitates collaborative relationships among healthcare professionals, particularly pharmacists and nurses. Nurses often assume the role of patient advocate, actively communicating patient experiences to the care team, while pharmacists

maintain a comprehensive view of medication regimens across multiple healthcare providers and episodes of care (D. Hager et al., 2015). Effective collaboration between pharmacists and nurses, characterized by frequent interaction, shared goals and knowledge, and mutual respect and trust, reinforces a commitment to a broad patient care agenda, thereby strengthening interprofessional partnerships (Labrador Barba et al., 2017). Pharmacists contribute to the care team by cultivating the pharmacist-patient relationship, identifying and resolving medication-related problems, supporting patient adherence to therapy, and providing drug education and information. By sharing their pharmacological expertise with nurses, pharmacists enable more informed patient care. Nurses, who typically spend more time with patients and have detailed knowledge of their backgrounds, clinical conditions, and preferences, are well positioned to offer valuable patient-specific insights that complement the pharmacist's specialized knowledge, thereby enriching overall care. Continuous cooperation and teamwork between these professionals are essential for sustaining health improvements within the community and the larger global society.

1.5 2. The Role of Pharmacists in Patient Care

Pharmacists play a vital role throughout the continuum of patient care. Healthcare teams benefit significantly from the specialized knowledge and skills of pharmacists and from the positive impact that pharmacist-led programs have on clinical and economic outcomes. Within the healthcare team, pharmacists collaborate with physicians, nurses, and others to ensure appropriate medication usage and to optimize therapeutic outcomes. The involvement of pharmacists on multidisciplinary teams is associated with improved medication adherence, enhanced patient-centred care and increased patient safety. (D. Hager et al., 2015) The provision of pharmaceutical care involves the monitoring of ongoing therapy and the assessment of prescription and non-prescription medications for effectiveness, safety and for the potential of adverse drug reactions. Pharmacists identify drug related problems, collaborate with other members of the health care team and, where appropriate, provide advice to patients concerning their therapy. In developed countries, the community pharmacist is often the first point of contact for patients regarding health issues. In such settings, community pharmacists offer advice about a wide range of ailments and, working in tandem with physicians, provide a valuable and pragmatic service to members of the public. Since community pharmacists continue to be accessible, within convenient hours, on a walk-in basis and without appointment, such services are invaluable at a time when secondary and primary care services become ever more pressured. With the increased emphasis on interdisciplinary collaboration, the role of the pharmacist and other members of the health care team in ensuring patient adherence to medication therapy has been the subject of much research. (Siang Chua et al., 2012) Pharmacists feel that community nurses play a vital role in assisting vulnerable patients with limited ability to manage personal medication. More recently, the concept of pharmaceutical care has emerged, signifying a new paradigm in the delivery of pharmacy services. Pharmaceutical care implies the direct, responsible provision of medication-related care for the purpose of achieving definite outcomes that improve a patient's quality of life. Pharmaceutical care is underpinned by the notion of "collaborative practice" wherein the pharmacist cooperates with patient and other healthcare professionals in the design,

implementation and monitoring of a therapeutic plan that will produce specific therapeutic outcomes for the patient. The emergence of pharmaceutical care as the dominant professional practice within pharmacy means that the traditional notion of the pharmacist as the "dispenser of medicines" must, inevitably, take second place to the notion of the pharmacist as the "responsible medication consultant".

2.1. Medication Management

Pharmacists contribute to patient care by managing medications, enhancing understanding, encouraging appropriate use, and reducing risks. They monitor adverse drug reactions, assess drug effectiveness, and provide education about prescribed treatments. These activities promote compliance through communication. Nurses assess patients prior to pharmacists' review, coordinate care, and communicate clinical issues. They offer emotional support and advocacy during treatment and discharge, educate on therapies and prevention, and extend communication to family and caregivers. Interprofessional collaboration benefits the assessment, design, and monitoring of medication and treatment plans. Effective teamwork combines complementary expertise and experience; improves communication and decision-making; fosters a culture of mutual respect and trust; and accelerates skill development and dissemination. Pharmacists working with nurses help patients understand, select, obtain, and use medications appropriately, tailored to their homes and lifestyles. Nurses with pharmacists create holistic care plans that address problems and anticipate needs. Guiding principles include shared objectives, joint planning, definition of roles, ground rules for interaction, and means to build trust and resolve conflicts. Formal mechanisms can allocate time for detailed discussions. Approaches include multidisciplinary team meetings; case conferences; established points of contact; joint records; and embedded electronic systems. Collaboration enhances nurses' assessment of medication effectiveness, side effects, correct usage, and drug interactions. (Kristeller et al., 2017) (Labrador Barba et al., 2017)

2.2. Patient Education

When nurses are equipped with adequate knowledge regarding medication use, they are more likely to initiate effective patient education, enhancing overall health outcomes. Nurses do not prescribe medication; however, it is crucial that they fully understand the pharmacology to provide appropriate guidance and educational health programs related to medication use. Encouraging patients to adhere to prescribed medication regimens is a time-consuming task for nurses, yet their position as professional caregivers capable of recognizing symptoms that warrant caution grants them significant influence in promoting compliance. Patient education and communication are integral to enhancing medication adherence (F. Bowen et al., 2017).

2.3. Adverse Drug Reaction Monitoring

Adverse drug reactions (ADRs) are significant contributors to hospital admissions, underscoring the necessity of effective monitoring mechanisms (Hughes et al., 2020). Pharmacists play a pivotal role in this context by participating in the detection, assessment, and prevention of ADRs occurring during hospital stays, which represents a critical component of pharmaceutical care (Baniasadia et al., 1970). Although clinical pharmacy residents may outperform nurses alone in identifying

serious ADRs, nurses have a distinct advantage in recognizing reactions outside the conventional scope of pharmacists' inquiries.

Enhanced cooperation between pharmacists and nurses facilitates comprehensive pharmacovigilance, enabling the timely identification and management of ADRs that patients might otherwise encounter. The complexity involved in discerning whether an ADR affects the length of hospital stay, or leads to disability or death, is further complicated by individual patient variables such as disease severity and social circumstances. Hence, sustained collaborative teamwork between these professions is essential to promote sustainable improvements in health outcomes and ensure patient safety in the face of ADRs.

1.6 3. The Role of Nurses in Patient Care

Nurses are essential members of the healthcare team, delivering care and providing support to patients in both hospital and community settings. Given their close, sustained contact with patients, nurses play a critical role in patient assessment and are well positioned to coordinate care among members of the healthcare team. Nurses also advocate on behalf of patients. Many pharmacist-patient contact points occur through the nurse, making the partnership between the two professions especially crucial (Al-Salloum et al., 2020). They may monitor their clients' response to medications and provide information regarding the treatment regimen, diet and behaviour modification, or adverse drug reactions. Since they spend more time with their patients, they have opportunities to discuss non-adherence, whereas in many settings pharmacists do not (Siang Chua et al., 2012). Studies assessing the barriers to patient adherence have shown that a lack of communication and interaction with physicians and pharmacists was commonly encountered, emphasising the importance of the nurse-patient contact point (Labrador Barba et al., 2017). Nurses act as intermediaries and frequently liaise with the physician and pharmacist in an attempt to slow the cycle of iatrogenic or preventable adverse events.

3.1. Patient Assessment

Strategies to enhance collaboration between pharmacists and nurses include scheduled team meetings, crafting collaborative care plans, and engaging in mutual training sessions. Pharmacists, often in charge of medication management, patient education, and monitoring adverse drug reactions, provide a foundation for joint patient care. Nurses undertake patient assessments, coordinate care, administer medications, and advocate for patients to ensure accessibility and understanding. The interprofessional team uses defined approaches to jointly evaluate patients' health status, ensuring preventive treatment and the administration of necessary vaccines. Combining the pharmacist's and nurse's perspectives, a multidisciplinary team performs comprehensive assessments involving tailored questions specific to the patient's clinical situation, therapeutic needs, lifestyle, and demographic characteristics, thereby facilitating tailored healthcare strategies (Labrador Barba et al., 2017) (M. Rife et al., 2012).

A thorough evaluation of the patient's medical history and associated treatments fine-tunes the information needed for a complete assessment. Ensuring that interventions regarding medications, delivery formats, and the timing of intake optimize patient adherence, the close interaction between pharmacist and nurse promotes outcomes that remain unattainable under routine

individual care. Timely and coordinated pharmacist–nurse collaboration enables the rapid identification of non-adherence causes, spanning a broad spectrum from difficulties in managing polypharmacy and side effects to cognitive impairments, swallowing problems, or lack of health literacy.

3.2. Care Coordination

The nurse is often the first health care professional to encounter the patient and the family. The nurse shares with the pharmacist a complete knowledge of the patient from the point of view of health history, the current condition and treatment, and the physical and emotional state. A continuous on-going relationship with the patient enables the nurse to monitor and report progress and changes within the parameters of the training and defined roles of the different team members. Collaboration between the two professionals will guarantee that problems related to medical plans that are beyond the scope or experience of one professional can be immediately brought to attention and resolved. Continuous monitoring facilitates necessary modifications to meet the patient's changing needs (R. Doucette, 2019). Nurses may assume the responsibility of identifying candidate patients and dispensation of the medication. Both professionals who interact frequently with physicians can bring to their attention health problems or complications related to medical care. Nurses and pharmacists should participate in the identification and resolution of such problems (Labrador Barba et al., 2017).

3.3. Patient Advocacy

Nurses frequently advocate for patients' concerns regarding medications and therapy. Pharmacists should strive to understand and prioritize the perspectives of patients and nurses by seeking detailed explanations about observed issues or complaints (Labrador Barba et al., 2017). This approach enables the development of practical, individualized interventions. Although the nature of concerns might vary over time as adherence improves, continuous teamwork remains essential for sustainable health enhancements.

1.7 4. Importance of Interprofessional Collaboration

Comprehensive patient care obliges specialists to share their knowledge to ensure optimal medical decisions. Successful inter-professional collaborative partnerships involve effective communication, shared goals, and mutual trust. Such enduring relationships require continuous maintenance and a team-based approach to promote sustainability. Creating a team spirit focused on the patient benefits everyone involved and should characterise collaboration between a pharmacist and a nurse.

4.1. Improving Communication

Pharmacists and nurses continue to adapt and enhance their roles to meet changing healthcare demands. They represent a considerable and growing portion of the patient care workforce, and their collaboration is an important means of ensuring quality care and continuity. However, their distinct roles and responsibilities require good communication if their collaboration is to have successful patient centred results.

The emphasis on consumer-centred care models in many modern healthcare systems has led to greater focus on the relationships within the patient-health professional triad. The quality of the

relationship and communication between patients, pharmacists and nurses influences the effectiveness of care delivery and patient outcomes (Thinsan, 2015). Both nursing and pharmacists have been reported to experience difficulties establishing effective communication and trust with consumers and explaining new medicines clearly and meaningfully. Understanding why these difficulties occur is important in improving communication and collaboration among nurses, pharmacists and consumers regarding patient care and adherence to medication. Pharmacists and nurses should strive for continuous teamwork leading to sustainable improvements in patient health. Coordinated by a patient-centred approach, better communication and collaboration between these professions can address broader priorities such as adherence, reducing avoidable medicines-related hospitalisations and improving access to primary healthcare services.

4.2. Shared Goals and Responsibilities

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4.3. Building Trust Among Professionals

Successful interprofessional collaboration among healthcare professionals relies on lateral and vertical communication, shared goals, and the development of trust within professional teams. Within emergency care, collaboration between doctors and pharmacists has the potential to improve patient outcomes, yet crossing a collaboration chasm remains a tedious process (Al-Salloum et al., 2020). Building collective and situational trust can assist in overcoming this barrier by promoting shared responsibility and future-focused collaboration among team members. Pharmacists situated at hospitals have worked to increase medication safety and position themselves as an undeniable presence within interprofessional teams. As the nature of collaboration between emergency physicians and pharmacists continues to evolve, trust emerges as a vital constituent; mastering relevant skills and embracing role clarity can facilitate respectful team dynamics that favour sustainable health improvements.

Trust represents a critical component in the delivery of pharmaceutical care. The role of the pharmacy team has shifted from primarily dispensing medications to providing patient-centred pharmaceutical care, which can only be maintained through the establishment of trust (te Paske et al., 2023). At the level of individual patients, higher trust in pharmacists fosters openness, more effective communication, and improved adherence, while at the collective level this outcome can be translated into a fundamental professional commitment that informs interprofessional working. Collaboration among medical professionals enhances patient satisfaction, treatment effectiveness, and safety, particularly in the management of chronic diseases (Zielińska-Tomczak et al., 2021). Poland's healthcare professionals hold positive attitudes towards cooperation, but encounter structural and procedural barriers stemming from a lack of willingness to collaborate and the persistence of communication gaps; the absence of collaborative platforms prevents the development of trusting relationships. From the perspective of pharmacists, the establishment of

trust depends upon optimistic perceptions of engagement, expertise, and communication. Yet while much research on medical teams underscores the significance of trust, cross-professional collaboration remains an understudied domain: a comprehensive understanding of its mechanisms is therefore of the utmost importance.

1.8 5. Strategies for Effective Collaboration

Interprofessional collaboration forms the foundation for effective pharmacist–nurse partnerships. Communication, shared goals, and mutual trust encourage collaborative relationships and optimize patient care. There are several strategies to enhance pharmacist–nurse collaboration:

• Regular interdisciplinary team meetings. Scheduled interactions among pharmacists, nurses, and other health professionals facilitate discussion of patient problems and resolution of drug-related issues.

• Collaborative care planning. Pharmacists and nurses jointly develop patient care plans based on complementary expertise.

• Joint educational and training initiatives. Creating opportunities for shared learning further integrates both disciplines.

Incorporating these approaches strengthens teamwork and pays dividends in improved collaboration. Building upon the recognized importance of interprofessional collaboration, the following practical strategies provide a framework to elevate pharmacist–nurse partnerships (Pringle & C Coley, 2015).

5.1. Regular Team Meetings

With nurses, pharmacists require professionals to whom medications can be immediately referred—uninterrupted correspondences of a patient who does not undergo any consultation without the presence of a nurse presiding during the encounter, and thus absenting the pharmacist's outreach in these chance-to-deliver moments. At regular meetings, nurses outline the needs of a given patient (down to the hour), they can be made aware of medications ready for dispensing (which the nurse checks becomes, at minimum, the starting point of a multidisciplinary plan), and the team can discuss recent changes, with prescriptions and requests made promptly available to the entire team (Labrador Barba et al., 2017). Such communication channels—the pharmacist about to qualify numerous interventions, which the nurse can pursue without hesitation—is needed to afford the originally advocated scope and explains the survival of a failure-rate that moves from exceeding 60 percent (the proposed benchmark) to under 20 percent (the working combined complianceobstacle-overcoming figure) within a few months. Team meetings form the most basic element of continuous communication (J. Issetts et al., 2003). In addition to their direct impact on patient progress, they also enable the development of collaborative care plans, formulation of multidisciplinary care interventions, joint patient follow-up, and functioning as platforms to discuss concerns, receive questions, and share system developments (D. Hager et al., 2015). For sustained health and beneficial cures, the practice of the pharmacist and nurse as a team should be considered a baseline—the continuous rhythm upon which everything develops and which dictates, perhaps unnecessarily, the pace at which patients can be served. A professional effort of this magnitude is accordingly required to support a broadening of the pharmacist's impact in the

consideration of the entire healthcare system and to make any further requests on the collaboration between two already equally pressed professions. Although the latter partially contributes to the transformation of the assistant nurse—still a firmer longer-term prospect—the emphasis on the inherent capability of the collaboration, and on enhanced common understanding and cross-sharing of roles, remain of primary concern because they are likely a precondition for any further development or official recognition of a partnership.

5.2. Collaborative Care Plans

Care plans provide a useful organizing framework to facilitate coordination among multiple-healthcare practitioners. Based on Darzi and Fitzpatrick's broader definition of medicine—"an art and a practice of the maintenance of health through the prevention, diagnosis, alleviation, and cure of disease in individual patients" (R. Doucette, 2019) —health-care professionals have complementary roles, all focused on patient benefit. Pharmacists have assumed an effective leadership in coordinating care plans for individual patients, drawing in other professionals when necessary and providing the capacity to revisit and revise plans.

5.3. Joint Training Programs

The Joint Royal Pharmaceutical Society of Great Britain and Royal College of Nursing document "Standards of Education for Pharmacists and Nurses" emphasized the importance of collaborative education for healthcare professionals (Boland et al., 2018). Broader recognition among leading organizations has led to a European core curriculum for graduate healthcare professionals (Patel et al., 2018). Such initiatives highlight that, without evidence demonstrating effectiveness and a commitment by educators and managers to embed collaboration into continuing professional development, plans for shared education and training are unlikely to succeed.

Interprofessional learning represents a natural extension of team and collaborative working in addressing complex patient care. Greater integration between interprofessional learning and collaborative practice enhances capacity to foster effective team-working and continuous care improvement. Authorities in the respective professions, such as the General Pharmaceutical Council and General Nursing Council, have issued statements on educational standards incorporating interprofessional learning and team-working modules.

1.9 6. Barriers to Collaboration

Pharmacists and nurses indeed face barriers, such as lack of understanding of each other's capabilities and limited opportunities to collaborate, impacting effective communication and healthcare delivery. Collaboration is especially challenging when professionals are not co-located, as physicians predominantly discuss collaboration in terms of pharmacists present within their clinic, despite many pharmacists practicing externally (D. Hager et al., 2015). Communication challenges also arise from patient factors (language barriers, disabilities), clinic dynamics (medication brand changes, remote consultations), disruptive or ineffective intervention methods, and inadequate documentation, all of which affect patient safety and professional satisfaction (Tan et al., 2024). Addressing these obstacles requires targeted interventions involving all parties, improved communication platforms, and integrated decision-support systems to facilitate collaboration and reduce errors.

6.1. Professional Silos

Silos of expertise have been identified as a persistent barrier to interprofessional collaboration. Traditionally, pharmacists have operated separately from nursing and other healthcare professions in the medication-use process, contributing further to isolated decision-making (Labrador Barba et al., 2017). The educational models of the two professions have frequently encouraged such a divide. Pharmacists have often been trained predominantly within the pharmacy setting, other than clinical instruction rotations, while nurses have been taught in nursing schools. Interaction and collaboration do not consistently receive emphasis, and each discipline has been expected to perform the "full range" of its respective duties, resulting in lack of appreciation and underutilization of the complementary roles of each (Zielińska-Tomczak et al., 2021). Part of the challenge arises from the very different nature of the respective jobs and routines and approaches of pharmacists and nurses; direct participant observation demonstrates the difficulties of combining these contrasting perspectives into an integrated and collaborative effort, although a framework is available for developing interprofessional collaboration.

6.2. Lack of Understanding of Roles

Pharmacists and nurses are human services experts with a shared interest and committed responsibility to deliver safe and effective healthcare services. The continuous, open collaboration of these two groups of health practitioners is required if the safety and quality of therapeutic systems for all patients are to be sustained and consistently enhanced. Optimal and holistic backwards and forwards medication-oriented strategy must be pursued until better and profoundly broad persists the production of health and a profitable level of wellbeing.

The two groups play complementary roles in the improvement of patient compliance and outcomes, as outlined below.

Pharmacists overview medicine and actively establish a positive check and balance system within both the community and clinical sectors. Responsible for providing a broad selection of healthcare services, they advise, dispense, monitor therapy and patient progress, assess adverse reactions and the effects of medication, and counsel on the most appropriate use of non-prescription drugs (D. Hager et al., 2015). Similarly, nursing practice centers on the assessment of patients' health status, the coordination and implementation of care plans, and the provision of support and advice to patients and their family members (Labrador Barba et al., 2017).

In the current healthcare provision system pharmacists maintain an increasing accountability for the provision of direct patient care. Healthcare professionals scarcely acknowledge the humanistic and cognitive services introduced by community pharmacists, and conversely the profession of pharmacists globally fails to recognize the significance and responsibilities of nurses in patient healthcare management (Zielińska-Tomczak et al., 2021).

The reputable combination of the various disciplines by a group of appropriately guided, co-ordinated and integrated practitioners leads to a higher care standard and increased patient benefits than the individual contribution of each discipline. The pharmacist-nurse professional interaction has a fundamental effect on the treatment of the chronic external dementia disease state and the associated management of patients' medical therapy.

6.3. Time Constraints

Health care services face increasing workload and complexity and, at times, professionals can experience time constraints, limiting their abilities to care for their patients in the quality and quantity they desire. When pharmacists and nurses have to perform multiple daily tasks, this means that tasks related to collaboration, such as spending time together or participation in team meetings, can become difficult to prioritise (M. Rife et al., 2012).

1.10 7. Case Studies of Successful Collaboration

Collaboration between pharmacists and nurses in clinical settings has been shown to enhance patient compliance and outcomes by improving communication, coordination, and continuity of care. In chronic disease management, pharmacists and nurses have worked together to increase adherence and reduce inappropriate medication use. For example, integrated teams in ambulatory care clinics have delivered comprehensive medication therapy management to patients with diabetes, leading to better glucose control and fewer adverse events. At transitions of care, hospital and community pharmacists have coordinated medication management to minimize discrepancies and lower readmission rates (Kristeller et al., 2017). Telemonitoring programs broadcast real-time vital sign data to both professional groups, enabling joint patient follow-up that reduced unnecessary medication use. In home health settings, collaborative assessments by pharmacists and nurses have identified gaps in care that were subsequently addressed through coordinated interventions. Targeted education and counseling through pharmacist–nurse partnerships have reinforced adherence strategies and helped to maintain patients' quality of life (J. Issetts et al., 2003).

7.1. Chronic Disease Management

Over the past century, the role of pharmacists has rapidly evolved due to multiple factors, including the dramatic increase in the number and complexity of available therapeutics. Pharmacists who were once concerned predominately with drug products are now involved almost exclusively with drug therapy and medication use. As a result, a pharmaceutical care mission of the pharmacist has changed from providing drug products to achieving definite outcomes from drug therapy for the purpose of improving a patient's quality of life. For example, chronic diseases such as diabetes, hypertension, cancer, etc. require a definite level of patient compliance to treatment plans; however, patient compliance may be low due to a lack of knowledge or information, complex drug, lifestyle changes, or financial concerns (Center for Chronic Disease Prevention and Health Promotion (U.S.), 1970). Therefore, pharmacists spend time with patients and provide education regarding the provision of drug therapy and lifestyle changes that meet the individual expectation of the patient. Pharmacists are involved in a number of personnel activities that contribute to continuity care, including assessing patient conditions related to medication; monitoring adverse drug reactions; recommending interventions for identified drug-related problems; educating patients on the proper use of medications; and documenting patient information.

7.2. Medication Therapy Management

In the modern healthcare setting, pharmacists often serve as essential members of a multidisciplinary care team, working collaboratively with physicians and nurses to maximize

patient treatment outcomes. Medication therapy management (MTM) encompasses a broad range of activities aimed at optimizing therapeutic outcomes, including medication reconciliation, initiating pharmacotherapy, transferring and coordinating care, and documenting and communicating patient information. While MTM applications vary globally, pharmacists generally share core competencies that involve providing professional advice, participating actively in therapeutic decision-making, and ensuring optimal monitoring and evaluation of drug therapies. Within this system, nurse–pharmacist partnerships have become integral components of healthcare provision in many countries, such as England and China (Labrador Barba et al., 2017) (R. Doucette, 2019).

7.3. Patient Transition of Care

Following discharge and transfer to ambulatory, nursing home, or home settings an extensive number of medication-related adverse events occur. The transition of care from hospital to home is susceptible to a lack of coordination and continuity, especially related to medication management. This is particularly problematic for patients with comorbidities such as heart failure and COPD. Communication and collaboration between inpatient and outpatient healthcare providers during care transitions is often lacking, leading to fragmented patient care. Patient education about medications on the day of discharge is often rushed and overwhelming, resulting in patients not being prepared to manage their medications once transitioned to home. Many programs target reducing 30-day readmissions, which are incentivized by financial penalties for hospitals with high readmission rates. High-risk patients may be assigned a dedicated transition provider who coaches them to take an active role in healthcare and communicate effectively with providers. The interventions include hospital visits, home visits, and follow-up calls within 30 days. This model encourages accurate health and medication history, and effective communication with providers. Evidence shows these approaches can reduce hospital readmissions, and many healthcare systems incorporate care-transition managers to improve transitional care (Kristeller et al., 2017).

1.11 8. Impact on Patient Compliance

Pharmacist-nurse collaboration facilitates better understanding of patients' concerns about medication and enables tailoring of evidence-based interventions underpinned by patient preferences and needs. Regular interactions with patients, systematic follow-up, and inquiries about medication use maintain high adherence levels. Structured counselling that compares current medication use with prescriptions helps identify concerns and questions at early stages. Home monitoring of medication intake, physical activity, and blood pressure extends assessment and enables timely intervention. Such collaboration encourages further engagement and systematic implementation of effective, affordable strategies for achieving and sustaining adherence could reduce clinical complications and costs, and improve quality of life (M. Rife et al., 2012).

Provision of culturally appropriate medication information and support strengthens intention to initiate and maintain therapy. Collaborative relationships enhance internal motivation, self-regulation, and resource management. A holistic approach addresses diverse factors influencing

adherence—daily routines, individual health trajectories, external resources, emotional states, and perception of problem-solving capacities—ensuring sustained productivity and stability.

Collaboration is particularly critical during transitions of care, when communication becomes more complex and medication changes are frequent. Pharmacist-nurse teams work jointly with patients and caregivers to explain altered regimens, identify adherence barriers, and provide tailored support. Making electronic health records accessible to community pharmacies enables long-term tracking of rehospitalised patients and facilitates rapid, personalised response to changes.

The evolving roles of pharmacists in community and hospital settings position them as pivotal partners supporting the wider healthcare system. Accepting and accounting for challenges presented by multi-morbid patients, institutional constraints, and regulatory frameworks are essential for transforming an existing dyad into a more interactive triad encompassing nurses, patients, and other professionals.

8.1. Understanding Patient Needs

Patient-centred communication has an important role in interactions among health care providers and patients. Sharing patient information enables members of the health care workforce to understand each patient's needs, priorities, preferences, concerns, and wishes. Collecting information from multiple sources increases understanding when there are barriers to communication, such as language, literacy, numeracy, cultural differences, or cognitive impairment (Thinsan, 2015).

Pharmacists and nurses hold complementary skills in assessing patients' knowledge and understanding about medicines. Nurses often observe patient behaviour first-hand, helping identify adherence concerns at an early stage when patients refuse, delay, or postpone taking medicines (Labrador Barba et al., 2017). They monitor patients regularly and can identify significant variations in how medicines are taken. Medication non-adherence is as problematic as symptoms of the disease itself; it leads to more complications, increased hospital-stay rates, reduced clinical efficacy of prescribed treatments, or even preventable fatalities. Consequently, pharmacists and nurses regularly discuss how patient-centred concerns have the potential to impact health outcomes (M. Rife et al., 2012).

The nature of collaboration between pharmacists and nurses is well suited to the settings and populations they serve. When stemming from shared clinical objectives, each group supports the other and succeeds in improving patient care and satisfaction throughout the patient journey. Routing procedures to ensure the flow of relevant information must be put in place and followed for the quality of conversation to be maintained. When communication is impaired or informal collaboration is required, the quality of services offered diminishes considerably. Both professionals share the common goal of delivering quality and timely care, working closely together in hospital, outpatient, and community settings to ensure continuity of care. Where collaboration works well, success is directly attributable to openness between organisations, ease of communication, clarity of job roles and descriptions, and respect of each other's contribution to patient care.

8.2. Tailoring Interventions

To enhance patient compliance, collaborations between pharmacists and nurses must design individualized interventions that consider each patient's condition and must continually revisit and adjust these plans because adherence issues can be transient, recovering over time. Nurses, through their comprehensive monitoring of patient progress and social determinants, can determine when a patient may benefit from renewed pharmacist input—overcoming the practitioner silos that otherwise silo assessments (M. Rife et al., 2012). Their knowledge of the therapeutic context is equally valuable when pharmacists identify suspicious or unstable medication regimens. Interventions must also be sensitive to the patients' ability to act. Both professionals should know patients' health literacy and medication management skills before advising changes because adherence is invariably limited by controllable barriers (Verloo et al., 2017). Repeated restrictions are therefore less effective than supporting patients to improve their capacities. Encouraging the use of reminders and cue systems or involving family members in the care process are preferred complements. Indeed, an ongoing engagement framework that supports capacity and through which patients can report difficulties is a fundamental feedback resource. Without it, interventions may simply be inconsistent reminders.

8.3. Monitoring Compliance Rates

The critical role that interprofessional teamwork plays in achieving optimal patient-care outcomes has gained recognition over recent decades. Evidence indicates that greater interprofessional collaboration between nurses and pharmacists improves patient safety, enhances patient education, and increases patient satisfaction. Patient metrics are also positively influenced, including improved medication adherence, reduced healthcare costs, and decreased hospitalisation rates. Given the pressure placed on healthcare systems worldwide, sustainably enhancing patient outcomes is key.

The nurse's alignment with the pharmacist's role in supporting patients is extensive and has expanded. Interprofessional collaborative poise offers a practicable means of realising this, with communication, shared goals and trust identified as essential to building and maintaining strong collaborative relationships. A synthesis of strategies focusing on avenues to enhance their opportunities for cooperation further supports and facilitates such joint working.

The multitude of practical settings in which collaborative working occurs has been catalogued, with an increasing focus on patient compliance and its relationship to improved patient outcomes. Nurses are frequently known as the "most trusted healthcare providers […], the primary point of care, and the primary source of medication information"; in dealing extensively with patients at all stages of the hospital discharge medication process. The mental, emotional and physical toll of illness, injury and hospitalisation diminishes patients' ability to absorb information, placing greater reliance upon each interaction. Enquiries into the impact of collaborative working on patient compliance again support a generic beneficial influence, with powerful multivariate analyses concluding that such collaboration identifies and addresses specific factors influencing non-compliance. (M. Rife et al., 2012) (Labrador Barba et al., 2017)

1.12 9. Impact on Patient Outcomes

Collaboration between pharmacists and nurses in healthcare practice contributes to a consistent medication adherence and consequently better patient outcomes. This approach is also necessary to overcome the limited role of healthcare providers and the inadequate patient information.

This structure allows the combination of the skills of the two professionals to cover a wide range of patient care, in particular concerning medications. Pharmacists manage medication therapy, identify and resolve drug-related issues, and monitor adverse drug reactions. Nurses assess patient needs, coordinate care, and provide advocacy. In all this, the communication, understanding and trust between the two professions are fundamental (Labrador Barba et al., 2017).

The collaboration toolkit includes a range of techniques that promote both interprofessional care and interaction between patients and healthcare workers. Patients can also be encouraged to monitor and report adverse effects themselves. Regular contact and follow-up ensure that patients are aware of their responsibilities and able to maintain their therapeutic plan over time (M. Rife et al., 2012).

The cooperation also fosters a deeper understanding of patients' needs, with the possibility of tailoring interventions to improve their adherence and hence the associated measurements (Thinsan, 2015). For instance, the impact can be observed as better health literacy, an increased quality of life, and a reduced rate of hospital admission or readmission. These positive effects can be promoted to a wider population by supporting the development of pharmacist–nurse collaboration at a systemic level.

9.1. Quality of Life Improvements

Patient compliance with therapy is affected by the extent to which discharge plans and treatments meet expectations during hospitalization. Pharmacists offer complementary training and additional information to nurses on treatment options, enabling nurses and physicians to provide care aligned with patient needs. Ensuring discharge plans and treatments meet patient expectations can have a positive impact on quality of life, particularly in reducing hospital readmission rates and hospital-related costs for both the patient and the healthcare system. Collaboration among pharmacists, nurses, physicians, and patients is essential to address these compliance issues. The roles and knowledge of nurses or social workers involved in patient care should be considered in future studies to enhance pharmacist-nurse collaboration further (Thinsan, 2015) (Labrador Barba et al., 2017).

9.2. Reduction in Hospital Readmissions

Hospital readmissions are among the adverse events that may be prevented through pharmacist-nurse collaboration. A community-pharmacy pilot study found that pharmacist involvement in discharge follow-up reduced readmissions and identified drug-related problems (Snodgrass et al., 2013). Incorporating more pharmacists, technician support, or efficient scheduling would increase patient contact and allow pharmacists to focus on clinical issues. An innovative academic-medical-centre model of pharmacist-coordinated ambulatory-care transition interventions was associated with improved clinical, organisational, and financial outcomes, including reduced 30-day readmissions (Cavanaugh et al., 2020). The practice model is replicable across hospital clinics and

adaptable by other health systems. Collaborative approaches involving hospital and community pharmacists also facilitate medication management throughout transitions of care and from hospital to home (Kristeller et al., 2017). Communication and collaboration between inpatient and outpatient providers is often inadequate, and discharge-day medication education is rushed and overwhelming. Such conditions leave patients ill-prepared to manage their therapies after discharge and contribute to medication non-adherence and re-hospitalisation. A variety of integrated transition models draw on the complementary roles of nurses and pharmacists to support medication management and continuity of care, reduce preventable medication-related adverse events, and improve adherence. Assigning a transition-provider—often a nurse or social worker—to coach patients in self-management, communication and tracking encourages accurate health and medication histories. Coaching is supplemented by hospital and home visits and follow-up calls during the ensuing month. Despite evidence of reduced 30-day re-admissions, comprehensive medication management during transitions remains an area for further enhancement.

9.3. Enhanced Health Literacy

Poor health literacy can adversely affect medication management and patient outcomes (John et al., 2023). Pharmacists can improve patients' health literacy by carefully explaining the mechanism of action of their medications and the common adverse effects to be aware of. The teach-back method can be employed to confirm understanding and engage patients in their health plans. The provision of information is best delivered in simple, layman's terms, with opportunities for patients to ask questions. Pharmacists are also encouraged to repeat the information on the medication label, such as by explaining that a "water pill" increases urination to aid hypertensive patients in understanding when and why to take it. Inhaler instructions can be communicated with a demonstration and subsequent patient repetition to ensure correct use. The "Ask Me 3" campaign promotes further engagement by encouraging patients to ask about the main problem addressed by the prescription, the necessary actions required, and the reasons underlying them. More extensive understanding of the rationale for treatment encourages patients to redouble their efforts to adhere to the prescribed regimen.

1.13 10. Future Directions in Collaboration

In light of the enduring challenges faced by healthcare providers, ongoing professional collaboration can play a critical role in enhancing both patient medication compliance and healthcare outcomes. Through reliable communication and coordinated care, pharmacists and nurses are able to delineate prescribed care plans and determine the most effective intervention strategies (Wang et al., 2018). Technological innovations, including electronic health records and telemedicine platforms, make it easier for the two teams to share information and communicate in real time, while policy amendments can promote integrated care models within healthcare organizations. Continuous professional training opportunities, along with additional empirical research, will contribute to a more comprehensive understanding and further refinement of collaborative practices. Ultimately, advanced partnerships between pharmacists and nurses constitute an important resource for shaping patient-centered care and further improving healthcare outcomes.

10.1. Integration of Technology

The incorporation of technology into the Pharmacy Practice Model Initiative (PPMI) provides notable opportunities for interprofessional collaboration. Technological advancements have the potential to automate or eliminate tasks and workflows, official reports to training agencies indicate. At the same time, the adoption of electronic health records and other technologies creates new opportunities for pharmacists to contribute to patient care.

Pharmacists are already expanding the use of technology to enhance patient-centered care. For example, automated dispensing machines can reduce the time required to prepare medications and release pharmacists for direct care activities. Similarly, bar-code technology has been documented to reduce the incidence of dispensing errors (Hahn et al., 2014).

The adoption of technology may also foster expanded collaboration between pharmacists and other health professionals. Organizations such as the World Health Organization and the Institute of Medicine have emphasized the importance of interprofessional education and collaborative practice, in part because interprofessional networks improve health outcomes. The University of Southern California enlists clinical coaches to promote interprofessional collaboration through a process of team building and co-creation of patient-centered health programs. Many universities in the United States have recognized the value of interprofessional education through offerings such as the interprofessional practice certificate at the University of Washington School of Pharmacy; a minor in health-care design at Washington University in St. Louis; interprofessional encounters at the University of North Carolina; the I-PHARM model at the University of Colorado; and the interprofessional clinical experience at Purdue University.

10.2. Policy Changes

Policy changes continually influence healthcare dynamics; nonetheless, ongoing collaboration remains crucial to sustainable improvement in patient quality of life. Pharmacists influence medication quality through interventions, reductions in dosages, cost savings, and prevention of adverse drug reactions, while nurses provide patient education and assess patient attitudes toward health-maintenance programs. Increased pharmacist–nurse collaboration can enhance patient compliance and downstream health outcomes (Labrador Barba et al., 2017).

Effective communication, mutual respect, shared goals, role clarity, and trust are fundamental to interprofessional care and determine the nature of the pharmacist–nurse relationship; existing frameworks have been developed to guide related research and policy. Confirmation of the benefits of collaboration through case studies in enhanced medication management, chronic-disease management, and care transitions has renewed interest in collaborative strategies (Hahn et al., 2014).

10.3. Research and Evidence-Based Practices

(Pringle & C Coley, 2015) highlight the pervasive issue of poor adherence to prescribed medication. Patients typically consume less than half their prescribed doses, a shortfall linked to poor health outcomes and increased healthcare costs from hospitalizations and emergency visits. Pharmacist-led interventions exhibit mixed effectiveness, prompting a call for enhanced strategies, implemented individually or with other healthcare providers, to consistently improve adherence.

A published framework outlines evidence-based components that community pharmacists can apply to foster better compliance and catalyze pharmaceutical innovation. Aligning with the principles of evidence-based practice, (Eriksson, 2015) asserts that adherence optimization constitutes a critical facet of personalized treatment. Good compliance not only amplifies therapeutic benefits but also mitigates adverse effects. He advises practitioners to confirm that prescribed treatments are both evidence-based and tailored to the patient, then to continually engage the patient in addressing potential barriers to compliance. This ongoing collaboration ensures that expectations and outcomes remain aligned, maximizing the likelihood of successful intervention. In combination, these insights underscore the imperative for collaboration between pharmacists and nurses, who together can apply tailored, evidence-based approaches to enhance medication adherence and patient outcomes.

1.14 11. Conclusion

The role of pharmacists has expanded to include functions, such as collaborative medication management, drug therapy management, drug use reviews, and pharmacovigilance. Nurses provide care coordination, patient assessment, and act as patient advocates and educators. The roles of pharmacists and nurses complement each other and make collaboration effective and essential. Interprofessional collaboration builds on communication, cooperation, responsibility and accountability, assertiveness in conflict, autonomy, mutual trust, respect, and shared goals. These enablers motivate the involvement of both professionals in joint patient care to address individualized patient needs and improve compliance and outcomes. Continuous teamwork remains the most effective strategy for sustainable enhancements in health outcomes. Advancements in healthcare technology, social policy, and economic regulation are likely to expand nurses' roles in medication-related activities, further intensifying collaboration opportunities with pharmacists. (Labrador Barba et al., 2017) (Zielińska-Tomczak et al., 2021) (Thinsan, 2015)

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