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Multidisciplinary Collaboration Between Nurses and Physiotherapists: Enhancing Patient Recovery Outcomes

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Abstract

This paper explores the synergistic collaboration between nurses and physiotherapists, two professions with distinct yet complementary roles in patient recovery. It traces the evolution of interprofessional teamwork from siloed practices to integrated models, examining practical models in acute care, specialized rehabilitation, and community settings. The paper evaluates the impact of this synergy on key patient outcomes, confirming that effective nurse-physiotherapist collaboration is associated with enhanced functional mobility, accelerated patient independence, reduced hospital length of stay and readmission rates, more effective pain management, and improved patient satisfaction. The paper also discusses strategies to overcome common barriers and foster a sustainable culture of collaboration, including interprofessional education, the development of integrated care pathways, and the cultivation of organizational support systems. The paper concludes that the integration of nursing and physiotherapy expertise is essential for optimizing patient recovery and advancing modern healthcare delivery.

Keywords: *Interprofessional Collaboration, Nursing, Physiotherapy, Patient Outcomes, Rehabilitation, Team-Based Care, Patient-Centered Care.*

Introduction

The delivery of healthcare in the 21st century is defined by an escalating complexity of patient needs, driven by an aging global population, the rising prevalence of chronic diseases with multiple comorbidities, and rapid technological advancements [1]. In this environment, the traditional model of care, characterized by distinct professional silos, has proven inadequate. No single healthcare professional possesses the complete range of knowledge and skills required to address the multifaceted physical, psychological, and social dimensions of a patient's health journey. This reality has given rise to a paradigm shift towards team-based, patient-centered care, where the coordinated efforts of multiple disciplines are leveraged to achieve superior outcomes. Central to this paradigm is the collaboration between nurses and physiotherapists. These two professions, while possessing unique scopes of practice, share a common focus on patient function, well-being, and recovery. The nurse, with a continuous presence at the bedside, provides holistic care, constant monitoring, and crucial care coordination. The physiotherapist,

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an expert in movement and functional restoration, delivers specialized, targeted interventions to rebuild strength, mobility, and independence (Khattak et al., 2021). When these roles are integrated through effective collaboration, they create a powerful synergy that transforms the nature of patient care, turning episodic treatments into a continuous, reinforced therapeutic process. This paper posits that this multidisciplinary collaboration is a critical determinant of patient recovery, leading to demonstrable improvements in clinical, systemic, and patient-reported outcomes.

Defining the Collaborative Paradigm in Healthcare

Multidisciplinary collaboration in healthcare is a cooperative approach wherein a group of healthcare professionals with diverse areas of expertise work together to provide the best possible patient care [2]. This model involves harnessing the unique talents, perspectives, and skills of various disciplines, each contributing to a comprehensive care plan while often working in parallel on discipline-specific goals [3]. This approach is recognized by the World Health Organization (WHO) and numerous other international institutions as an essential component for delivering high-quality, safe, and patient-centered care [4].

A distinction is often drawn between multidisciplinary and interdisciplinary collaboration. While multidisciplinary teams involve professionals from different fields working alongside each other, interdisciplinary collaboration signifies a higher level of integration. In an interdisciplinary model, professionals integrate their unique disciplinary methods and perspectives into a single, unified consultation and treatment strategy, characterized by shared decision-making and interdependent goal setting [5]. The most effective collaborative teams often exhibit these interdisciplinary characteristics, moving beyond parallel practice to a truly integrated approach. Regardless of the specific terminology, the fundamental principle is the same: teamwork enhances clinical care and therapy management. A substantial body of evidence demonstrates that this collaborative paradigm yields significant benefits for both patients and healthcare systems, including a reduction in adverse events, decreased medical errors, shorter hospital stays, lower readmission rates, and increased patient satisfaction [6].

The Nurse: Coordinator and Advocate in Patient Care

The role of the nurse is foundational to the functioning of any healthcare system and central to the patient experience. Nursing practice is fundamentally defined by the delivery of direct patient care and the fulfillment of roles as advocate and health educator for patients, their families, and the broader community. Nurses work across the health continuum to promote health, prevent disease, and care for individuals with acute and chronic illnesses [7]. Their responsibilities are vast and varied, encompassing a continuous cycle of assessment, planning, intervention, and evaluation. This includes conducting comprehensive patient assessments by observing, measuring, and recording vital signs, symptoms, reactions to treatment, and overall progress [8].

While nurses (unless they are advanced practice nurse practitioners) do not independently diagnose conditions or prescribe medications, they are responsible for implementing the medical plan of care, which includes administering medications and treatments as ordered by physicians and monitoring patients for effects and side effects [7]. Perhaps one of their most critical functions is that of care coordination. Often described as the "captain of the ship," the registered nurse manages the myriad moving parts of a patient's care, ensuring that all aspects—from specialist consultations to therapy sessions and case management—are integrated to achieve the

best possible outcomes [9]. They serve as the primary communication nexus, relaying vital information between the patient, their family, and the diverse members of the healthcare team, including physicians, pharmacists, and therapists [8]. Because nurses typically spend significantly more time in direct contact with patients than any other healthcare professional, they gain unique and profound insights into their patients' physical condition, emotional state, personal needs, and progress over time, positioning them as powerful and essential patient advocates.

The Physiotherapist: Specialist in Movement and Functional Restoration

Physiotherapists, also known as physical therapists, are trained and licensed movement experts who play a pivotal role in patient rehabilitation and recovery. Their practice is dedicated to diagnosing and treating individuals of all ages who face medical problems or health-related conditions that limit their ability to move and perform functional activities in their daily lives [10]. The core purpose of physiotherapy is to improve a person's range of motion, functional ability, and quality of life, while also preventing further injury or disability. They provide care across a wide variety of settings, including hospitals, outpatient clinics, rehabilitation centers, and community health agencies.

The responsibilities of a physiotherapist begin with a comprehensive examination and assessment of the patient's movement, flexibility, strength, and functional performance. This includes identifying potential "red flags" that may indicate serious underlying pathology requiring referral to another specialist. Based on this assessment, the physiotherapist formulates a clinical diagnosis, prognosis, and a personalized plan of care with specific short- and long-term goals [11]. Interventions are multifaceted and may include therapeutic exercise to restore strength and flexibility, manual therapy techniques to improve joint function, and the use of physical modalities to reduce pain and inflammation. A crucial component of their role is patient education, empowering individuals with self-management strategies and developing fitness and wellness programs to promote healthier and more active lifestyles. Physiotherapists are essential in post-surgical rehabilitation, particularly in orthopedic, neurological, and cardiopulmonary contexts, where their interventions are critical for reducing pain, preventing complications such as muscle atrophy and deep vein thrombosis, and restoring maximal functional ability.

The Synergy of Complementary Roles in a Patient-Centered Model

The true power of the nurse-physiotherapist partnership lies not in the simple addition of their respective skills, but in the multiplicative, synergistic effect that emerges from their collaboration. The relationship is built on a foundation of complementary expertise. The nurse, as the constant presence, provides a holistic, 24-hour perspective on the patient's status, managing their medical needs, monitoring their response to all activities, and coordinating the overall plan of care. The physiotherapist, as the focused specialist, provides deep expertise in biomechanics and functional restoration, designing and initiating targeted interventions during specific therapy sessions. When these two roles are effectively integrated, the impact on patient recovery is profound.

This synergy transforms the care environment. An exercise or mobility plan designed by a physiotherapist is no longer confined to a 30- or 60-minute session. Instead, it becomes a continuous therapeutic principle integrated into the patient's entire day. The nurse, fully aware of the rehabilitation goals and specific techniques, can prompt, guide, and assist the patient with prescribed movements during routine care activities such as repositioning in bed, transferring to

a chair, or walking to the bathroom [12]. This constant reinforcement dramatically increases the therapeutic "dosage" the patient receives, accelerating progress. Furthermore, the communication loop becomes continuous and dynamic. The nurse can provide the physiotherapist with real-time feedback on the patient's pain levels, fatigue, or tolerance of an activity, allowing for immediate adjustments to the therapy plan [13]. Conversely, the physiotherapist can educate the nurse on optimal handling techniques and signs of functional improvement to watch for. This collaborative process creates what can be described as a "24/7 rehabilitation environment," where every interaction becomes an opportunity to advance the patient's recovery. This integrated model ensures that both the medical stability managed by the nurse and the functional progress driven by the physiotherapist are addressed in a coordinated, holistic manner, placing the patient's comprehensive needs at the center of all activities.

Problem Statement and Purpose of the Analysis

Despite the compelling theoretical rationale and a growing body of supportive evidence, the effective and consistent implementation of multidisciplinary collaboration between nurses and physiotherapists remains a significant challenge in many healthcare settings. The potential of this powerful synergy is often unrealized due to persistent systemic and cultural barriers. These obstacles include structural issues such as different reporting hierarchies and scheduling conflicts, process issues like inadequate communication channels and a lack of shared care protocols, and cultural issues rooted in historical professional boundaries, a lack of mutual understanding of roles, and insufficient joint training opportunities. These barriers lead to fragmented care, missed opportunities for therapeutic reinforcement, and ultimately, suboptimal patient recovery outcomes. The failure to systematically foster this collaboration represents a critical gap in the delivery of high-quality, efficient, and patient-centered care.

Therefore, the purpose of this paper is to conduct a comprehensive, evidence-based analysis of the multidisciplinary collaboration between nurses and physiotherapists. It aims to move beyond a simple acknowledgment of its importance by synthesizing the existing literature to achieve four primary objectives: (1) to explore the historical and theoretical foundations that underpin this collaborative practice, providing context for its current imperative; (2) to describe and analyze effective models of nurse-physiotherapist collaboration as they are operationalized across diverse clinical settings, from the intensive care unit to the community; (3) to critically evaluate the measurable impact of this collaboration on a range of patient recovery outcomes, drawing on robust clinical evidence; and (4) to identify and recommend evidence-based, actionable strategies that healthcare organizations, educators, and policymakers can implement to overcome existing barriers and strengthen this vital professional partnership.

Background and Rationale

The contemporary emphasis on interprofessional teamwork in healthcare is not a recent invention but rather the culmination of a long evolutionary process. Its trajectory reflects a growing understanding of the complexity of human health and the limitations of a fragmented, discipline-centric approach to care. The rationale for integrating the expertise of professionals like nurses and physiotherapists is rooted in a rich history of clinical innovation and is supported by well-established theoretical frameworks of team dynamics and collaborative practice. This section will trace the historical development of multidisciplinary care from its ancient philosophical origins to its modern, evidence-based imperative. It will also explore the theoretical models that provide the blueprint for designing and implementing effective interprofessional teams, establishing the context for why nurse-physiotherapist collaboration is

a fundamental component of modern healthcare delivery.

Historical Trajectory

The philosophical underpinnings of collaborative, holistic care can be traced back to antiquity. The Hippocratic Corpus, for instance, advocated for a holistic approach that sought homeostasis of both body and soul, implying a cooperative relationship between physicians, nurses (*therapainides*), and psychologists [14]. However, the formal development of the modern multidisciplinary team is a 20th-century phenomenon. Pioneering efforts in the United States include the work of Richard Cabot at the Massachusetts General Hospital in the early 1900s, who wrote about the "teamwork of the doctor, the educator, and the social worker," and the establishment of hospital outreach teams of physicians, social workers, and nurses by Martin Cherkasky at New York's Montefiore Hospital in 1948 [15].

A pivotal catalyst for the widespread adoption of team-based care was World War II. The clear effectiveness of multidisciplinary medical and surgical teams in managing the complex trauma of soldiers demonstrated the profound benefits of integrated expertise [15]. This wartime success story led to the establishment of similar specialty-oriented teams in civilian healthcare, particularly in fields like surgery, burns, and rehabilitation, where patient needs were complex and multifaceted [16].

The period from the 1960s to the 1990s can be characterized as the "pioneering phase" of interprofessional education (IPE) and practice, particularly in the United Kingdom and the United States [17]. This era was marked by a grassroots movement driven by developments in primary and community care. As healthcare services moved into community centers, professionals who had previously worked at a distance were brought into close proximity, exposing professional tensions and a lack of mutual understanding of roles. In response, numerous IPE initiatives emerged, often in the form of workshops and conferences, with the initial aim of resolving these "problematic relationships" and fostering better teamwork. Key milestones from this period include the founding of the Centre for the Advancement of Interprofessional Education (CAIPE) in the UK in 1987 and the launch of the *Journal of Interprofessional Care* in 1992, which helped establish IPE as a legitimate academic discipline [18].

The turn of the 21st century ushered in the "promotional phase," during which IPE and collaborative practice transitioned from a marginal, bottom-up movement to a mainstream, top-down policy imperative [17]. This shift was heavily influenced by a series of landmark reports on patient safety, such as the Institute of Medicine's "To Err is Human," which highlighted medical errors and fragmented care as major systemic problems [18]. These reports provided a powerful impetus for rethinking professional relationships and embedding team-based care into the very structure of healthcare education and delivery. This evolution reflects a significant change in perspective: collaboration was initially conceived as a reactive solution to observed problems like professional friction, but it is now institutionalized as a proactive, foundational strategy for designing safer, more effective, and more resilient healthcare systems.

The Modern Healthcare Imperative for Nurse-Physiotherapist Collaboration

The rationale for robust collaboration between nurses and physiotherapists has never been more compelling. Several converging trends in modern healthcare make this partnership not just beneficial, but essential. The first is the demographic and epidemiological shift towards an older population with a higher burden of chronic, complex diseases [1]. Older patients frequently

present with multimorbidity, polypharmacy, and frailty, requiring a comprehensive care approach that seamlessly integrates medical management, functional rehabilitation, and psychosocial support [19]. A single professional cannot adequately address this web of interconnected needs. The nurse's expertise in managing complex medical issues and the physiotherapist's expertise in combating functional decline and frailty are indispensable and complementary components of effective geriatric care.

Second, the paradigm of patient-centered care has become the ethical and practical standard for healthcare delivery. This model requires that care be respectful of and responsive to individual patient preferences, needs, and values. Achieving this necessitates a holistic approach that considers the patient as a whole person, not just a collection of symptoms or a specific diagnosis [3]. The combined perspective of the nurse, who often gains deep insight into the patient's personal context and emotional state, and the physiotherapist, who focuses on the patient's functional goals and life participation, is critical to creating a truly patient-centered and holistic care plan [20].

Finally, healthcare systems worldwide are facing immense pressure to deliver high-value care—that is, to improve patient outcomes while controlling or reducing costs. A large body of evidence now demonstrates that collaborative care models are a key strategy for achieving this goal. By improving care coordination, reducing medical errors, and preventing complications, interprofessional teams enhance operational efficiency [21]. Specifically, nurse-physiotherapist collaboration has been shown to reduce costly hospital lengths of stay and prevent avoidable readmissions, which are major drivers of healthcare expenditure [22]. In an era of finite resources, the imperative to adopt models of care that are both clinically effective and economically efficient makes the systematic implementation of nurse-physiotherapist collaboration a strategic necessity.

Theoretical Foundations: Models of Interprofessional Practice and Team Dynamics

Effective collaboration does not happen by chance; it is built upon a theoretical foundation that explains the dynamics of teamwork and outlines the core competencies required for successful interprofessional practice. These theoretical frameworks provide the necessary blueprints for proactively designing and cultivating high-functioning healthcare teams. A systematic review of the literature has identified six core competency domains for interprofessional collaboration: patient-centered care, interprofessional communication, participatory leadership, conflict resolution, teamwork, and, critically, a transparency of duties and responsibilities. This last domain, which involves a clear understanding of one's own role and the roles of others, is considered essential for any collaborative effort, as it allows team members to leverage each other's unique knowledge and skills effectively [23].

One practical framework that operationalizes these competencies is the "Five C's Model," which posits that effective collaboration is built upon five key components: communication, coordination, cooperation, conflict resolution, and coaching. This model provides a tangible guide for teams to build and maintain collaborative practice by focusing on these core processes. For example, it emphasizes the need for standardized communication protocols to overcome differences in professional jargon and communication styles, which are often significant barriers to effective teamwork [24].

Underpinning all collaborative frameworks is the concept of trust. Trust within an interprofessional team is a multifaceted phenomenon that extends beyond simple collegiality.

Theories of workplace trust distinguish between two primary forms: cognition-based trust and affect-based trust. Cognition-based trust is rooted in a rational evaluation of a colleague's reliability, dependability, and professional competence. It is the confidence that a team member has the skills and knowledge to perform their role effectively. Affect-based trust, in contrast, stems from the emotional bonds that form between individuals, built on mutual care, benevolence, and a sense of psychological safety [1]. In the healthcare context, both are essential. A nurse must have cognition-based trust in a physiotherapist's ability to safely mobilize a complex patient. Simultaneously, the affect-based trust developed through respectful communication and shared experiences allows for open dialogue, mutual support, and the psychological safety needed to question, challenge, and learn from one another. High-functioning teams are those that have successfully cultivated both dimensions of trust, creating an environment where the collective expertise of the group can be fully realized for the benefit of the patient.

Models of Nurse-Physiotherapist Collaboration in Clinical Practice

The principles of interprofessional collaboration are not merely abstract ideals; they are operationalized daily in diverse clinical settings, each with its unique demands and patient populations. The nature of the collaboration between nurses and physiotherapists is highly adaptable, shifting along a continuum of integration that is dictated by the acuity of the patient's condition, the complexity of the care environment, and the goals of the treatment phase. In high-acuity settings like the intensive care unit, collaboration is immediate, interdependent, and focused on survival and the prevention of complications. In specialized rehabilitation units, it becomes a deeply integrated, goal-oriented process aimed at maximizing functional recovery. In community and primary care, the model often shifts towards coordination and consultation, focused on long-term management and health promotion. This section will explore these different models, using evidence-based examples to illustrate how the nurse-physiotherapist partnership is put into practice across the continuum of care.

High-Acuity Settings: Collaboration in Intensive and Postoperative Care

In high-acuity environments such as the intensive care unit (ICU) and immediate postoperative recovery areas, the collaboration between nurses and physiotherapists is critical and time-sensitive. In the ICU, where patients are often sedated, ventilated, and hemodynamically unstable, early mobilization is a key intervention for preventing complications like ventilator-associated pneumonia, ICU-acquired weakness, and delirium. Nurses in the critical care setting perceive physiotherapists as integral and essential members of the multidisciplinary team, with a primary role in mobilizing these complex patients. The collaboration here is necessarily tight and highly communicative. The critical care nurse provides the physiotherapist with continuous, real-time information regarding the patient's stability, level of sedation, respiratory status, and medication schedule (e.g., timing of analgesia). This information is vital for the physiotherapist to determine the safety, timing, and intensity of any mobilization intervention. In turn, nurses observe and value the direct benefits of physiotherapy, reporting that mobilization facilitates quicker weaning from mechanical ventilation, accelerates discharge from the ICU, and improves patient mood and reduces pain complaints [25]. This creates a positive feedback loop where successful, safe mobilization reinforces the value of the collaboration for both professions.

Similarly, in the postoperative setting, particularly following major orthopedic surgery such as joint replacements or spinal procedures, early and effective collaboration is paramount for optimal recovery [26]. The primary goals are to manage pain, prevent complications like deep

vein thrombosis and pulmonary embolism, and initiate mobilization as soon as safely possible. This requires a coordinated effort. The physiotherapist assesses the patient's postoperative status, establishes weight-bearing restrictions and mobility protocols, and initiates early exercises. The nurse's role is to manage the patient's pain effectively to allow for participation in therapy, assist with transfers and ambulation using the specific techniques taught by the physiotherapist, and monitor the patient's response to activity, including vital signs and surgical site integrity [12]. A breakdown in this collaboration can lead to delayed mobilization, increased risk of complications, and longer hospital stays. Recognizing the importance of building these collaborative skills early, many educational institutions have developed acute-care simulation models where nursing and physical therapy students work together on complex patient scenarios. These interprofessional educational experiences have been shown to improve students' confidence, clinical skills, and their understanding of and appreciation for each other's roles, providing a foundational model for future practice [20].

Specialized Rehabilitation Units: Integrated Approaches in Stroke and Orthopedic Recovery

Specialized inpatient rehabilitation units represent a setting where nurse-physiotherapist collaboration reaches its highest level of integration. In these environments, the entire team, including physicians, nurses, physiotherapists, occupational therapists, speech-language pathologists, and social workers, functions as a cohesive, interdisciplinary unit focused on a shared set of patient-centered goals. Stroke rehabilitation is a quintessential example of this model. A large body of high-quality evidence, including a Cochrane systematic review, has unequivocally demonstrated that organized inpatient care provided in dedicated stroke units by multidisciplinary teams improves patient outcomes, leading to reduced mortality and a greater likelihood of patients being independent and living at home one year after their stroke [6]. The accepted best practice in stroke care is a coordinated, interprofessional team approach.

A case study of "Ms. Riddle," a 78-year-old woman recovering from a significant stroke, provides a vivid illustration of this integrated model in action [27]. From the initial team meeting, the collaboration was structured and goal-oriented. The registered nurse (RN) monitored Ms. Riddle's medical status and tolerance of medications. The physical therapist (PT) assessed her mobility and wheelchair needs. The occupational therapist (OT) evaluated her ability to perform activities of daily living (ADLs). The speech-language pathologist (SLP) assessed her communication and swallowing. The team's assessments were not conducted in isolation; they were shared, and the resulting rehabilitation plan was deeply collaborative. For instance, the PT and SLP worked together to determine the best way to mount a communication device on Ms. Riddle's wheelchair, an intervention that required both mobility and communication expertise. The OT and SLP shared responsibility for monitoring feeding and mealtime activities. This ongoing, deeply integrated collaboration, facilitated by daily morning meetings and quarterly full team meetings, resulted in significant functional gains for the patient, including improved self-feeding and successful use of her communication board [28].

This highly integrated model is also prevalent in orthopedic and musculoskeletal rehabilitation units. Here, the synergy between the physiotherapist's specialized interventions and the nurse's 24-hour care management is critical for achieving rehabilitation goals [28]. Studies have shown that this collaborative approach is associated with positive outcomes, including decreased length of stay for patients undergoing hip surgery and high levels of patient satisfaction [20]. In these highly functional teams, there can even be a "blurring of interprofessional boundaries," where

nurses, having been trained by physiotherapists, confidently perform practices that might traditionally be seen as within the physiotherapy domain (e.g., guiding specific exercises), and physiotherapists become more involved in aspects like pain management. This role flexibility is not a sign of confusion, but rather a hallmark of a mature, integrated team where members are focused on achieving the patient's goals rather than rigidly adhering to professional silos.

Community and Primary Healthcare Collaboration

The need for nurse-physiotherapist collaboration extends well beyond the walls of the hospital into community and primary healthcare settings. Here, the focus often shifts from acute recovery to the long-term management of chronic conditions, health promotion, and the support of patient self-management [11]. The models of collaboration in this context are often more consultative and coordinative, but no less important. For patients with chronic conditions like rheumatoid arthritis or chronic obstructive pulmonary disease, nurses and physiotherapists work together to provide education, monitor disease activity, and develop sustainable physical activity plans that patient can manage in their own environment [29].

Several models facilitate this community-based collaboration. Co-consultations, where a physiotherapist and a nurse or general practitioner see a patient together, offer a highly efficient model for direct knowledge exchange, shared decision-making, and the creation of a unified care plan in a single visit [11]. In home care, collaboration is essential for managing complex, homebound patients, but it can also be more challenging as professionals may work for different agencies and communication can be less direct [30]. In this setting, the community or home care nurse often functions as the central care coordinator, acting as the primary link between the patient, their family, the general practitioner, and various therapists. Effective collaboration in this model relies heavily on clear and timely communication. For example, a physiotherapist on a home visit can teach a nurse specific technique for safe patient transfers or therapeutic positioning. The nurse can then incorporate these techniques into their daily care routine and provide the physiotherapist with feedback on the patient's progress and tolerance, effectively extending the therapeutic intervention well beyond the physiotherapist's visit [31]. However, a significant barrier in primary care is often a lack of knowledge among other professionals about the full scope of physiotherapy practice, which can limit referrals and hinder the development of more integrated care models. Overcoming this requires proactive education and advocacy from physiotherapists to ensure their skills are fully utilized within the primary care team.

The Impact of Collaboration on Patient Recovery Outcomes

The imperative for nurse-physiotherapist collaboration is not merely a matter of process improvement or professional preference; it is fundamentally driven by a robust and growing body of evidence demonstrating its direct and positive impact on patient recovery. When these two professions work in a coordinated and integrated fashion, the result is a range of measurable improvements across clinical, systemic, and patient-reported outcomes. This section provides a critical review of the evidence, synthesizing findings from numerous studies, systematic reviews, and meta-analyses. The analysis reveals a clear and compelling narrative: collaborative care models consistently outperform traditional, siloed approaches. The impact creates a virtuous cycle, where improved processes lead to better physical outcomes for the patient, which in turn drive greater efficiency for the healthcare system and culminate in a more positive overall experience for the patient.

Enhancing Functional Mobility and Accelerating Independence

A primary goal of rehabilitation, particularly after surgery, injury, or debilitating illness, is the restoration of functional mobility and patient independence. This is an area where the synergy between nursing and physiotherapy yields its most direct and observable benefits. Physiotherapists design and initiate specialized mobility programs, but it is the consistent reinforcement of these programs by nurses that translates therapeutic potential into tangible functional gains. Evidence from orthopedic departments shows that patients recovering from procedures like knee replacement surgery report significant and faster improvements in mobility when they are treated jointly by integrated teams of nurses and physiotherapists [32].

The mechanism for this improvement is clear. Nurses, who are with the patient around the clock, play a vital role in encouraging adherence to mobility protocols, assisting with prescribed exercises, and ensuring that patients use proper techniques during all functional activities, from getting out of bed to walking down the hallway [13]. This continuous reinforcement is crucial, as it transforms rehabilitation from an isolated event into an integrated part of the patient's daily routine. Nurses in rehabilitation settings explicitly value the specialized knowledge and skills that physiotherapists bring to the area of mobility and movement, recognizing this expertise as a cornerstone of the patient's recovery process [33]. This collaborative approach not only improves physical function but also empowers patients, giving them a greater sense of agency and involvement in their own rehabilitation. The result is a more rapid recovery trajectory and an earlier return to their baseline level of independence.

Optimizing System Efficiency: Reducing Hospital Stay and Readmission Rates

The clinical benefits of nurse-physiotherapist collaboration translate directly into significant improvements in healthcare system efficiency. Two of the most important metrics for hospital efficiency are length of stay (LOS) and 30-day readmission rates. A substantial body of evidence indicates that multidisciplinary and interprofessional teamwork is a powerful strategy for optimizing both of these outcomes. Numerous studies have demonstrated that organized, team-based care is associated with shorter hospital stays compared to standard, non-collaborative care [2]. More specifically, clinical observations have shown that when early and intensive physiotherapy interventions are integrated with routine nursing care, patients are often able to be discharged from the hospital several days earlier [22]. This effect has been specifically documented in orthopedic populations, where a collaborative approach for patients with hip fractures was linked to a statistically significant decrease in LOS [32]. By accelerating functional recovery, the nurse-physiotherapist team enables a safer and more timely discharge, which frees up valuable hospital beds and reduces the overall cost of care.

Beyond shortening the initial hospital stay, effective interprofessional collaboration is also a critical tool for preventing costly and disruptive hospital readmissions. A meta-analysis of team-based care models found an association with decreased readmission rates, particularly for high-risk patient populations [22]. This finding is supported by more targeted research. For example, a study focusing on older patients in rural hospitals found that an interprofessional collaboration intervention significantly reduced the 30-day readmission rate, with an adjusted hazard ratio of 0.66, indicating a 34% reduction in the risk of readmission for patients receiving team-based care [19]. The implementation of interprofessional post-hospital follow-up clinics, staffed by teams including nurse practitioners and other professionals, has also proven effective in reducing preventable readmissions [35]. The mechanism behind this is improved care coordination and discharge planning. A team-based approach ensures that patients are not only physically ready for discharge but are also well-educated, have the necessary equipment and support at home,

and have clear follow-up plans. Strategies that improve team communication, such as daily interprofessional bedside rounds, have been directly linked to dramatic reductions in readmissions (from 18% to 12% in one study) and subsequent emergency department visits [32].

Improving the Patient Experience: Collaborative Pain Management and Enhanced Satisfaction

The impact of nurse-physiotherapist collaboration extends beyond physical function and system metrics to fundamentally improve the patient's experience of care. This is particularly evident in the area of pain management. While pharmacological interventions remain a key component of pain control, there is a strong and growing emphasis on multimodal approaches that incorporate non-pharmacological strategies to improve efficacy and reduce reliance on opioids. The nurse-physiotherapist partnership is central to delivering this type of integrated pain management. Physiotherapists are experts in non-pharmacological interventions such as therapeutic exercise, manual therapy, and pain-relieving modalities [36]. Nurses, in their role, are responsible for comprehensive pain assessment, the timely administration of analgesic medications, and the implementation of comfort measures [37].

In a collaborative model, these roles are synergistic. The nurse can time the administration of pain medication to ensure the patient is comfortable enough to fully participate in and benefit from their physiotherapy session. The physiotherapist can teach both the patient and the nurse specific exercises, positioning techniques, or relaxation strategies that can be used to manage pain. The nurse can then reinforce these techniques throughout the day, providing the patient with a consistent, multimodal approach to pain control [37]. This holistic strategy, which addresses both the physical and psychological dimensions of pain, leads to better pain relief, improved function, and an enhanced sense of well-being for the patient [20].

This improved experience is reflected in one of the most widely used indicators of healthcare quality: patient satisfaction [22]. The evidence consistently shows a strong positive relationship between team-based care and patient satisfaction. A major systematic review of 21 studies found that 57% of them identified a statistically significant improvement in patient satisfaction associated with team-based care models. The review also found that satisfaction scores were higher when the teams were more comprehensive, involving more than two professions [38]. Clinical observations and patient interviews reveal that patients often express a profound sense of security, confidence, and satisfaction when they witness the coordinated efforts of their nurses and physiotherapists. This suggests that the psychological benefits of feeling cared for by a cohesive and communicative team are just as important to the patient's overall experience as the physical outcomes of the treatment [32].

A Synthesis of Evidence: Collaborative vs. Non-Collaborative Care Models

When the body of evidence is synthesized, a clear and compelling conclusion emerges: care delivered by collaborative teams of nurses, physiotherapists, and other professionals is demonstrably superior to care delivered in traditional, non-collaborative, siloed models. The contrast is not subtle; it is reflected in significant, statistically robust differences across a wide range of critical patient and system outcomes. The data moves the argument for collaboration from a theoretical ideal to an evidence-based necessity.

The most powerful evidence comes from systematic reviews and meta-analyses that aggregate the results of multiple studies. One such meta-analysis, which included 24 studies and over

14,000 patients, provided striking quantitative evidence of the benefits of interprofessional teams. The analysis found that patients who received care from an interprofessional team had a statistically significant 28% reduced risk of dying during their care episode compared to those receiving conventional care. Furthermore, patients in the intervention group had a 23% reduced risk of experiencing other treatment-related adverse outcomes [39]. This evidence strongly suggests that collaborative practice is not just a process improvement but a fundamental component of patient safety and quality of care.

The impact of collaboration can be understood as a causal chain. It begins with a more effective and integrated care process, characterized by better communication, shared goals, and coordinated interventions. This improved process leads directly to better clinical and physical outcomes for the patient, such as accelerated functional mobility and more effective pain management. These improved physical outcomes, in turn, drive better system outcomes, as patients who recover faster can be discharged sooner and are less likely to experience complications that lead to readmission. Finally, this entire positive experience—feeling the support of a cohesive team, achieving functional goals more quickly, and navigating the healthcare system more efficiently—culminates in higher levels of patient-reported satisfaction. This chain of effects illustrates that nurse-physiotherapist collaboration is a catalyst that sets in motion a virtuous cycle of improvement, benefiting the patient, the healthcare system, and the professionals themselves.

Strategies to Strengthen and Sustain Nurse-Physiotherapist Collaboration

Recognizing the profound benefits of nurse-physiotherapist collaboration is the first step; the more significant challenge lies in systematically creating and sustaining an environment where this collaboration can flourish. Overcoming entrenched professional silos, communication barriers, and structural impediments requires a deliberate and multi-faceted strategy. Evidence from the fields of healthcare management, education, and organizational psychology points to a range of interventions that can effectively foster a culture of teamwork. For collaboration to be truly embedded and sustainable, these strategies must be implemented across three interconnected levels: the **Individual** level, focusing on the education and competencies of healthcare professionals; the **Process** level, focusing on the standardization and structure of clinical workflows; and the **System** level, focusing on the organizational culture, leadership, and technological infrastructure that supports teamwork. An intervention at only one of these levels is unlikely to succeed; lasting change requires a comprehensive approach that aligns people, processes, and systems towards a common collaborative goal.

Foundational Training

The foundation for effective collaboration is laid long before professionals enter the workforce. Interprofessional Education (IPE) is a critical strategy that addresses the individual level by shaping the attitudes, knowledge, and skills of future practitioners. IPE is formally defined as occasions when students from two or more professions learn "with, from, and about each other to improve collaboration and the quality of care" [18]. The core purpose of IPE is to break down professional stereotypes and build a foundation of mutual respect and understanding from the very beginning of a professional's training [40].

A growing body of evidence demonstrates the effectiveness of IPE programs for nursing and physiotherapy students. When students participate in shared learning experiences, they show improved understanding of each other's professional roles and values, develop more positive

attitudes toward teamwork, and increase their readiness and confidence for future collaborative practice [41]. Effective IPE often utilizes active learning methodologies such as high-fidelity simulation labs, team-based learning activities, and collaborative case studies. For example, a study involving nursing and physical therapy students in a simulation lab found that the interprofessional experience resulted in significantly higher levels of student satisfaction and self-confidence in their clinical skills [42]. Similarly, team-based learning activities where nursing and physiotherapy students work together to solve a clinical problem have been shown to enhance their learning experience through interactive dialogue and knowledge sharing [43]. By embedding IPE into the core curricula of both nursing and physiotherapy programs, educational institutions can ensure that graduates enter the workforce not as isolated practitioners, but as team-ready professionals equipped with the essential competencies for collaboration.

Structural Frameworks

While IPE prepares the individuals, effective collaboration requires structured processes to guide their interactions in the complex clinical environment. Integrated Care Pathways (ICPs) are a powerful tool for achieving this at the process level. A care pathway is a standardized, evidence-based set of management guidelines or protocols applied to a specific group of patients with a similar condition, such as those undergoing a total hip replacement [44]. They function as a detailed roadmap for the patient's entire journey, outlining the necessary steps, interventions, and expected outcomes at each stage of care.

ICPs are inherently multidisciplinary and serve as a structural framework that operationalizes collaboration. They provide a shared algorithm and a common language that guides the decision-making of the entire team, including physicians, nurses, and physiotherapists [45]. By working from a single, evidence-based protocol, the pathway ensures that care is standardized, reduces the risk of errors or omissions, and clearly defines the roles and responsibilities of each team member at each point in the process [46]. The key components of a well-designed care pathway include standardized screening and assessment tools, the use of evidence-based interventions, clearly defined processes for monitoring progress and adjusting care, and an explicit team-based care model [44]. For example, a post-surgical orthopedic care pathway would specify when the first physiotherapy assessment should occur, the mobility goals for each postoperative day, the pain management protocol to be followed by the nurse, and the criteria for discharge. This level of structured coordination ensures that the efforts of the nurse and the physiotherapist are perfectly aligned and timed, maximizing efficiency and improving patient outcomes.

Fostering a Collaborative Culture

Even with well-trained individuals and well-designed processes, collaboration will fail to thrive without a supportive system-level environment. Cultivating an organizational culture that values and promotes teamwork is arguably the most critical and challenging component of a successful collaboration strategy. This begins with fostering effective communication. Communication is the bedrock of teamwork, and organizations must implement strategies to support it. This includes establishing formal channels for communication, such as regular, structured multidisciplinary team meetings or bedside rounds where the entire team can discuss patient progress and collaboratively plan care [45]. It is equally important to create physical and temporal space for informal communication, as these spontaneous interactions are often crucial for building relationships and resolving minor issues before they escalate [47]. The development of core communication skills, such as clarity, active listening, and providing constructive

feedback, should be a focus of ongoing professional development [48].

Technology can serve as a powerful enabler of this communication. The use of a shared Electronic Health Record (EHR) is fundamental, as it provides a single source of truth for all team members, ensuring that nurses and physiotherapists have access to the same up-to-date information about the patient's status, treatment plan, and progress [5]. Beyond the EHR, other health information technologies can be leveraged to facilitate timely, team-based communication, such as secure messaging platforms or electronic task queues that help coordinate care more efficiently [].

Ultimately, all strategies depend on a culture of mutual respect and trust. Organizational leadership plays a pivotal role in championing this culture. Leaders must explicitly endorse and model collaborative behavior, establish a shared vision for patient-centered care, and ensure that all team members feel psychologically safe to speak up, share their perspectives, and contribute to decision-making [1]. This requires a conscious effort to flatten traditional healthcare hierarchies and to recognize and value the unique expertise that both nurses and physiotherapists bring to the team. Before any new collaborative intervention can be successfully implemented, there must be a foundational acceptance and readiness for teamwork among the staff [48]. Building this culture of mutual respect is not a one-time initiative but an ongoing commitment that is essential for the long-term sustainability of any collaborative practice model.

Conclusion

The evidence synthesized in this comprehensive analysis leads to an unequivocal conclusion: the multidisciplinary collaboration between nurses and physiotherapists is a powerful catalyst for enhancing patient recovery outcomes. This partnership is not merely an optional process improvement but a fundamental component of high-quality, safe, and efficient healthcare delivery. By integrating the continuous, holistic care management of nursing with the specialized, functional expertise of physiotherapy, healthcare teams can create a therapeutic environment that accelerates recovery, improves patient safety, and enhances the overall patient experience. The transition from traditional, siloed models of care to integrated, team-based approaches is a necessary evolution to meet the complex demands of modern healthcare.

This paper has established that the value of nurse-physiotherapist collaboration is built upon the unique and complementary nature of their professional roles. The historical trajectory of healthcare has moved progressively towards this integrated model, driven by clinical necessity and supported by robust theoretical frameworks of teamwork and interprofessional practice. This collaboration is not a monolithic concept but is actualized through diverse and adaptable models across the entire continuum of care, from the high-stakes environment of the intensive care unit to the long-term management focus of community healthcare. The synergy created by this partnership transforms episodic interventions into a continuous, 24/7 rehabilitation process, fundamentally altering the nature and intensity of the care a patient receives.

References

- Corbaz-Kurth S, Weissbrodt R, Juvet TM, Hannart S, Krsmanovic B, Plaschy IS, et al. How does trust emerge in interprofessional collaboration? A qualitative study of the significance, importance, and dynamics of trust in healthcare teams and networks. *Journal of Interprofessional Care* [Internet]. 2025 May 15;1–10. Available from: <https://doi.org/10.1080/13561820.2025.2495013>
- Pradelli L, Risoli C, Summer E, Bellini G, Mozzarelli F, Anderson G, et al. Healthcare professional perspective on barriers and facilitators of multidisciplinary team working in acute care setting: a

- systematic review and meta-synthesis. *BMJ Open* [Internet]. 2025 Mar 1;15(3):e087268. Available from: <https://doi.org/10.1136/bmjopen-2024-087268>
- Albarqi MN. Assessing the impact of multidisciplinary collaboration on quality of life in older patients receiving primary care: cross sectional study. *Healthcare* [Internet]. 2024 Jun 25;12(13):1258. Available from: <https://doi.org/10.3390/healthcare12131258>
- Srinivas V, Choubey U, Motwani J, Anamika F, Chennupati C, Garg N, et al. Synergistic strategies: Optimizing outcomes through a multidisciplinary approach to clinical rounds. *Baylor University Medical Center Proceedings* [Internet]. 2023 Nov 7;37(1):144–50. Available from: <https://doi.org/10.1080/08998280.2023.2274230>
- ALSARHAYD MM, Bu Surur MA, ALBANNAY AK, Al Salem KI, ALNAJIM MF, Almatrook AH. THE IMPACT OF ELECTRONIC HEALTHCARE RECORDS ON THE CLINICAL BURDENS REGARDING COLLABORATIONS AMONG HEALTHCARE PROFESSIONALS.
- Clarke D, Forster A. Improving post-stroke recovery: the role of the multidisciplinary health care team. *Journal of Multidisciplinary Healthcare* [Internet]. 2015 Sep 1;433. Available from: <https://doi.org/10.2147/jmdh.s68764>
- Mayo Clinic College of Medicine and Science. Nurse - Explore Healthcare Careers - Mayo Clinic College of Medicine & Science [Internet]. Mayo Clinic College of Medicine and Science. Available from: <https://college.mayo.edu/academics/explore-health-care-careers/careers-a-z/nurse/>
- What are a registered nurse's responsibilities? [Internet]. Regis College. 2021. Available from: <https://www.regiscollege.edu/blog/nursing/registered-nurse-responsibilities>
- Goodwin University. 11 Nursing Responsibilities that Every RN Should Know [Internet]. Goodwin University. 2024. Available from: <https://www.goodwin.edu/enews/nursing-responsibilities/>
- Sarwar MF, Khalid MT, Sarwar MH, Sarwar M. Emerging responsibility of a physiotherapist in the healthcare system for an individual, family, community and country. *International Journal of Information and Education Technology* [Internet]. 2015 Jan;99–104. Available from: <https://www.researchgate.net/publication/350754714>
- Champoux M, Poirier A, Hudon C. Roles of physiotherapists in primary care teams: a scoping review. *BMJ Open* [Internet]. 2025 Feb 1;15(2):e092276. Available from: <https://doi.org/10.1136/bmjopen-2024-092276>
- Altaira. Collaborative Care: How nurses and physiotherapists can work together [Internet]. Altaira Allied Health & Wellness Centre. 2025. Available from: <https://altairahealth.com.au/collaborative-care-how-nurses-and-physiotherapists-can-work-together/>
- Barnes JJ. Improving interdisciplinary communication to improve patient satisfaction [Internet]. Master's Projects and Capstones. 2014. Available from: <https://repository.usfca.edu/capstone/105>
- Karassava H, Agorgianitis L, Mavrommatis E. The Genesis of Multidisciplinary Health Professionals Teams for Pain Management. A History from the Hellenic Antiquity to Modern Palliative Medicine. *Acta Medica Academica* [Internet]. 2024 May 14; Available from: <https://doi.org/10.5644/ama2006-124.439>
- Baldwin DC. Some historical notes on interdisciplinary and interprofessional education and practice in health care in the USA. *Journal of Interprofessional Care* [Internet]. 2007 Jan 1;21(sup1):23–37. Available from: <https://doi.org/10.1080/13561820701594728>
- Some historical notes on interdisciplinary and interprofessional [Internet]. National Center for Interprofessional Practice and Education. 2017. Available from: <https://nexusipe.org/informing/resource-center/some-historical-notes-interdisciplinary-and-interprofessional-education>
- Barr H. Medicine and the making of interprofessional education. *British Journal of General Practice*

- [Internet]. 2010 Mar 26;60(573):296–9. Available from: <https://doi.org/10.3399/bjgp10x484039>
- T F, T S, D H, J H. History and development of interprofessional education. *Journal of Phonetics & Audiology* [Internet]. 2015 Jan 1;1(1). Available from: <https://doi.org/10.4172/2471-9455.1000101>
- Ohta R, Sano C. The effectiveness of Family Medicine-Driven interprofessional collaboration on the readmission rate of older patients. *Healthcare* [Internet]. 2023 Jan 15;11(2):269. Available from: <https://doi.org/10.3390/healthcare11020269>
- Abdullah NGH. Holistic Patient Care: The Synergy between Physiotherapists and Nurses in Long-Term Care. *Power System Technology* [Internet]. 2024 Dec 20;48(4):3082–101. Available from: <https://doi.org/10.52783/pst.1181>
- Interprofessional collaboration in nursing: Examples and benefits [Internet]. Available from: <https://nursing.maryville.edu/blog/interprofessional-collaboration-in-nursing>
- Will KK, Johnson ML, Lamb G. Team-Based Care and Patient Satisfaction in the Hospital setting: A Systematic review. *Journal of Patient-centered Research and Reviews* [Internet]. 2019 Apr 29;6(2):158–71. Available from: <https://doi.org/10.17294/2330-0698.1695>
- Vaseghi F, Yarmohammadian MH, Raeisi A. Interprofessional collaboration competencies in the health system. *Iranian Journal of Nursing and Midwifery Research* [Internet]. 2022 Nov 1;27(6):496–504. Available from: https://doi.org/10.4103/ijnmr.ijnmr_476_21
- Hassan S, Shukla V, Ahmad S, Chandel S, Irfan S. TRANSFORMING PATIENT CARE THROUGH INTERPROFESSIONAL COLLABORATION: INSIGHTS, CHALLENGES, AND FUTURE DIRECTIONS [Internet]. *International Journal of Academic Medicine and Pharmacy*. 2024 Nov p. 104–7. Available from: [https://academicmed.org/Uploads/Volume6Issue6/20.%20\[4226.%20JAMP_Sharique\]%20104-107.pdf](https://academicmed.org/Uploads/Volume6Issue6/20.%20[4226.%20JAMP_Sharique]%20104-107.pdf)
- Gupte P, Swaminathan N. Nurse's perceptions of physiotherapists in critical care team: Report of a qualitative study. *Indian Journal of Critical Care Medicine* [Internet]. 2016 Jan 1;20(3):141–5. Available from: <https://doi.org/10.4103/0972-5229.178176>
- Decoyna JA. Interdisciplinary health team's experience in mobilising postoperative orthopaedic patients with altered mental status in a private hospital setting: a phenomenological study. *Master of Nursing Science (Orthopaedics)*. School of Nursing, Faculty of Health Sciences, The University of Adelaide; 2016 Jun.
- American Speech-Language-Hearing Association. Case Study: IPP Team Develops Rehabilitation Plan for Patient Recovering from Stroke [Internet]. Available from: <https://www.asha.org/practice/ipe-ipp/case-studies/case-study-4/>
- RIDDLE E, Social worker, Speech-language pathologist (SLP), Physical therapist (PT), Patient Family, Occupational therapist (OT). Interprofessional Practice (IPP) Team Develops Rehabilitation Plan for Patient Recovering from Stroke. *Gerontology* [Internet]. Available from: <https://www.asha.org/siteassets/ipp/case-study-04.pdf>
- Nisar Khattak, M., Muhammad, N., & Robinson, D. (2021). Understanding the interplay between support agencies and small and medium-sized enterprises in a conflict environment from an institutional theory perspective. *Asia-Pacific Journal of Business Administration*, 13(2), 256-271.
- Lehtomäki K, Ryhtä I, Peltonen J, Stolt M. Exploring the physical activity Counselling for patients with Rheumatoid Arthritis—Perceptions of nurses and physiotherapists. *Musculoskeletal Care* [Internet]. 2025 Jan 10;23(1). Available from: <https://doi.org/10.1002/msc.70053>
- Sekanina U, Tetzlaff B, Mazur A, Huckle T, Kühn A, Dano R, et al. Interprofessional collaboration in the home care setting: perspectives of people receiving home care, relatives, nurses, general practitioners, and therapists—results of a qualitative analysis. *BMC Primary Care* [Internet]. 2024 Mar 4;25(1).

- Available from: <https://doi.org/10.1186/s12875-024-02313-8>
- Geese F, Schmitt KU. Interprofessional collaboration in complex patient care transition: A Qualitative Multi-Perspective analysis. *Healthcare* [Internet]. 2023 Jan 27;11(3):359. Available from: <https://doi.org/10.3390/healthcare11030359>
- Tushe M, Oshafi E, Iljazi L, Sula R, Kurti X, Lagi E. Interdisciplinary Collaboration Between Nurses and Physiotherapists in the Care of Hospitalized Patients. Impact, Challenges and Best Practices. *J Mens Health Rep.* 2025;1(2):1-3. DOI: [doi.org/10.47363/JHMR/2025\(1\)102](https://doi.org/10.47363/JHMR/2025(1)102)
- Dalley J, Sim J. Nurses' perceptions of physiotherapists as rehabilitation team members. *Clinical Rehabilitation* [Internet]. 2001 Aug 1;15(4):380–9. Available from: <https://doi.org/10.1191/026921501678310180>
- Baldwin SM. Implementing post-hospital interprofessional care team visits to improve transitions of care and decrease hospital readmission rates [Internet]. 2016. Available from: <https://commons.lib.jmu.edu/dnp201019/1>
- Opper K, Beiler J, Yakusheva O, Weiss ME, Marquette University, Froedtert Hospital, et al. Effects of implementing a health team communication redesign on hospital readmissions within 30 days [Internet]. College of Nursing Faculty Research and Publications. 2019. Available from: https://epublications.marquette.edu/nursing_fac/641
- Saloum NSAA. Pain Management beyond Pills: The Physiotherapist-Nurse Dynamic in Non-Pharmacological Interventions. *Power System Technology* [Internet]. 2024 Dec 21;48(4):3478–94. Available from: <https://doi.org/10.52783/pst.1206>
- Zhang S, Li W, Zhang T. Nursing interventions in chronic pain management. *Journal of Innovations in Medical Research* [Internet]. 2023 Aug 1;2(8):32–41. Available from: <https://doi.org/10.56397/jimr/2023.08.05>
- Matthys E, Remmen R, Van Bogaert P. An overview of systematic reviews on the collaboration between physicians and nurses and the impact on patient outcomes: what can we learn in primary care? *BMC Family Practice* [Internet]. 2017 Dec 1;18(1). Available from: <https://doi.org/10.1186/s12875-017-0698-x>
- Webster CS, Coomber T, Liu S, Allen K, Jowsey T. Interprofessional learning in multidisciplinary healthcare teams is associated with reduced patient mortality: A quantitative systematic review and meta-analysis. *Journal of Patient Safety* [Internet]. 2023 Oct 25;20(1):57–65. Available from: <https://doi.org/10.1097/pts.0000000000001170>
- Cadet T, Cusimano J, McKearney S, Honaker J, O'Neal C, Taheri R, et al. Describing the evidence linking interprofessional education interventions to improving the delivery of safe and effective patient care: a scoping review. *Journal of Interprofessional Care* [Internet]. 2023 Dec 20;38(3):476–85. Available from: <https://doi.org/10.1080/13561820.2023.2283119>
- Society for Medical Education. Nursing and interprofessional education in the Experiential Learning Commons. Commons.
- Jung H, Park KH, Min YH, Ji E. The effectiveness of interprofessional education programs for medical, nursing, and pharmacy students. *Korean Journal of Medical Education* [Internet]. 2020 May 29;32(2):131–42. Available from: <https://doi.org/10.3946/kjme.2020.161>
- Ho JMC, Wong AYL, Schoeb V, Chan ASW, Tang PMK, Wong FKY. Interprofessional Team-Based Learning: A qualitative study on the experiences of nursing and physiotherapy students. *Frontiers in Public Health* [Internet]. 2022 Jan 31;9. Available from: <https://doi.org/10.3389/fpubh.2021.706346>
- National Council for Mental Wellbeing. Toolkit for Designing and Implementing Care Pathways [Internet]. Washington, DC: National Council for Mental Wellbeing; 2019. Available from: <https://www.thenationalcouncil.org/>

- Asmirajanti M, Hamid AYS, Hariyati TS. Clinical care pathway strengthens interprofessional collaboration and quality of health service: a literature review. *Enfermería Clínica* [Internet]. 2018 Feb 1;28:240–4. Available from: [https://doi.org/10.1016/s1130-8621\(18\)30076-7](https://doi.org/10.1016/s1130-8621(18)30076-7)
- Jerjes W, Harding D. Enhancing primary care through integrated care pathways: a convergence of theory and practice. *Frontiers in Health Services* [Internet]. 2024 Dec 12;4. Available from: <https://doi.org/10.3389/frhs.2024.1432901>
- The importance of interprofessional collaboration in healthcare [Internet]. Johnson & Johnson Nursing. 2023. Available from: <https://nursing.jnj.com/nursing-news-events/nurses-leading-innovation/the-importance-of-interprofessional-collaboration-in-healthcare>
- Sirimsi MM, De Loof H, Van Den Broeck K, De Vlieghe K, Pype P, Remmen R, et al. Scoping review to identify strategies and interventions improving interprofessional collaboration and integration in primary care. *BMJ Open* [Internet]. 2022 Oct 1;12(10):e062111. Available from: <https://doi.org/10.1136/bmjopen-2022-062111>.