

Interprofessional Collaboration AMONG Physiotherapy, Nursing, AND Pharmacy IN Healthcare: A Comprehensive Review

Hasel Mohamed Ahmed Alahmari¹, Maray Ali Mohammed Holal², Ghaliah Awwadh Alsuwat³, Abdullah Awadh Saleh Alfaraj⁴, Hussain Mana Ali Almansour⁵, Ahmad Samran Ali Aldosari⁶, Tahani Ramadan Abdullah Altayeb⁷, Batool Abdu Alasmari⁸, Saad Abdulaziz Ali Al-Ahmari⁹, Mubarak Salem Mishaan Al-Otaibi¹⁰, Naif Khalaf O Alanazi¹¹, Abdulaziz Rbaya Saad Alrbaya¹², Eissa Abdullah Bo Sarour¹³, Mahdi Hassan Alyami¹⁴

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2. Abu Arish General Hospitals Ministry of health kingdom of Saudi Arabia
3. Children hospital Ministry of health kingdom of Saudi Arabia
4. Muhammad Mubarak Misfer Al-Yami
5. Irada Mental Health Complex Ministry of health kingdom of Saudi Arabia
6. King Khalid hospital Ministry of health kingdom of Saudi Arabia
7. Alfaisalya phcc Ministry of health kingdom of Saudi Arabia
8. Cluster najran health kingdom of Saudi Arabia
9. Alsawari Primary health care Ministry of health kingdom of Saudi Arabia
10. Mahayil General Hospital Ministry of health kingdom of Saudi Arabia
11. Belhamar General Hospital Ministry of health kingdom of Saudi Arabia
12. Riyadh 3rd cluster ,Afif general hospital kingdom of Saudi Arabia
13. Emergency, Disaster and Health Crisis Management in Hafar Al-Batin Awthal primary helath care Center
14. King Khalid Hospital in Al Majma'ah Ministry of health kingdom of Saudi Arabia

Abstract

Integrated Health Care Delivery with Interprofessional Collaboration among Health Care Professions and Disciplines - Physiotherapy, Nursing, and Pharmacy - Are Vital, And Are The Focus And Purpose Of This Review. Interprofessional Collaboration And The Range Of Applications And Benefits Are Theoretical Elements Under Consideration. The Transition From The Earlier Systems With Siloed Structures And Disciplines In Health Care Delivery To Systems With Collaborative Care Has Been Brought About By Rapid Changes In The Environment, The Increased Complexity And Demand Of Patients And The Understandings Of More Favorable Health Results When Care Is Collaborative; Participation Of Various Disciplines Is Coordinated. This Report Discusses Interprofessional Education (IPE) As The Launching Pad For This Type Of Collaborative Approach, Reviews The Clinical Uses (Applications) Of This Collaborative Practice On Varied Patient Groups Across The Continuum – Chronic Disease, Pain, Geriatrics, Rehabilitation, And The Various Disciplines And Health Professions Of Nursing, Pharmacy And Physiotherapy, And The Interprofessional Collaboration Practiced In Health Care Delivery Systems. This Review Presents Evidence From Previous Research Documenting Increased Patient Outcomes And Positive Clinical Outcomes In Health Cost For Health Care And In Pharmacy Denial Of The Health Care System And Decreased Re-Admittance Rate Of Patients From The Evidence. Health Care Organizations Are Still Struggling With The Implementation Of This Evidence Due To Complexity, System

Hierarchy, Role Assumptions, Basic Interprofessional Collaboration In Health Care Delivery Systems, And Other Health Professions Implementation Gaps, As They Are Focused Beyond Pharmacy. To Move Forward With The Evidence Available To Optimal Interprofessional Collaboration To Achieve Patient-Centered Care, This Review Will Contribute To Health Care Administrators, Educators, And Clinicians.

Keywords: Interprofessional collaboration, physiotherapy, nursing, pharmacy, interprofessional education, patient outcomes, healthcare teams

INTRODUCTION

Complex and diverse patient needs, the rise of chronic illness, aging populations, and rapid advancements in healthcare have significantly shifted the healthcare model in recent decades. The previous model in healthcare, which was siloed based on profession, was ineffective and drove the change in how care is administered. As a result, the focus turned to interprofessional collaboration, where...

practice. Understanding both the facilitators and barriers to interprofessional collaboration is essential for developing strategies that promote successful integration of physiotherapy, nursing, and pharmacy services.

This comprehensive review examines the current state of interprofessional collaboration among physiotherapy, nursing, and pharmacy, analyzing theoretical frameworks, educational approaches, clinical applications, outcomes, barriers, and implementation strategies. By synthesizing evidence from diverse healthcare settings and patient populations, this paper aims to provide actionable insights for healthcare leaders, educators, and practitioners committed to advancing collaborative care models that optimize patient outcomes.

Conceptual Framework of Interprofessional Collaboration

Interprofessional collaboration represents a complex organizational and clinical phenomenon that requires robust conceptual frameworks to guide implementation and evaluation. At its core, IPC involves healthcare professionals from multiple disciplines working together with patients, families, and communities to deliver comprehensive care that addresses physical, psychological, social, and pharmaceutical dimensions of health.

Several theoretical models inform interprofessional collaboration in healthcare. The most influential framework, endorsed by the World Health Organization, conceptualizes IPC as the culmination of interprofessional education that prepares health professionals for collaborative practice. This framework posits that when health workers understand their own roles and those of other professions, communicate effectively, and share decision-making responsibilities, they create a "collaborative practice-ready workforce" capable of providing integrated health services.

Collaborative interprofessional teams consisting of physiotherapists, nurses, and pharmacists is an example of convergence of complementary expertise. Pharmacists understand pharmacokinetics, pharmacodynamics, and how drugs interact and can optimize medication therapy. They can identify and resolve medication-related problems, provide therapeutic recommendations, and create evidence-based pharmaceutical care plans. Physiotherapists assess and treat the musculoskeletal, neurological, cardiovascular, and respiratory systems through therapeutic exercise, manual therapy, electrotherapy, functional rehabilitation, and are trained in a variety of rehabilitation techniques. Nurses perform advocacy through monitoring, symptom management, education, care coordination, and advocacy, and they provide communication functions to other team members.

To engage in effective interprofessional collaboration, one must possess several core competencies outlined within specific interprofessional education models. Among these is the cultivation of interprofessional practice values and ethics, which involves mutual respect and a joint dedication to patient care. Role delineation, in which one professional has an understanding of their perspective scope of practice and their respective contributions from other team members, limits service overlap and ensures diverse coverage of patient needs. Interprofessional communication skills include the capacities of team members to share information, resolve disputes constructively, and make joint decisions. Ultimately, these include competencies for team collaboration such as leadership, shared decision-making, and resolution of disputes, which are critical for effective interprofessional teams.

Collaboration between physiotherapy, nursing, and pharmacy disciplines also hinges upon the biopsychosocial model of illness and health. Each discipline's role becomes evident when considering that the biopsychosocial model envisions health and illness as the result of the interaction and integration of biological, psychological, and social factors rather than the exclusive result of pathophysiological processes. Pharmacotherapy addresses the biological factors of the model as medication optimizers, physiotherapy attends to the physical and functional dimensions of the model, and also the psychological aspects such as fear-avoidance beliefs. Nursing integrates biological aspects through monitoring, psychosocial aspects through support and education, and nursing models. Each of these disciplines addresses one dimension of the biopsychosocial model and that's what makes the interprofessional teams able to put the model into practice.

The Role of Inter-Professional Education in Collaborative Practices

The Role of Inter-Professional Education in Collaborative Practices is to build the base for the competencies of interprofessional collaborative practice for physiotherapy, nursing and pharmacy students and professionals. IPE promotes interprofessional collaborations as it provides organized environments for learning that enables health professionals from various disciplines to communicate and share their expertise, and then collaboratively practice.

The pharmacy-physiotherapy interprofessional education model illustrates the creativity that goes into preparing collaborative practitioners. Studies show that pharmacy and physiotherapy students improve their understanding of the scope of each profession, communication skills, and preparedness for interprofessional collaboration when they participate in joint educational activities. Educational experiences help pharmacists educate physiotherapists, who eventually appreciate the role of physiotherapists in the musculoskeletal, neurological and cardiovascular rehabilitation. Simultaneously, physiotherapists learn the importance of pharmacotherapy, medication management and monitoring of adverse effects.

In the same way, nursing-pharmacy collaborative education activities have been of great benefit in preparing nurses and pharmacists for team work in medication management, patient safety, and chronic disease management. Educational activities, together, help nursing students appreciate the pharmacists' perspective, who has specialized knowledge in medication, while pharmacy students appreciate the nurses' role in medication administration, patient monitoring, and care coordination.

The effective interprofessional education programs have in common a few, very, specific attributes. They all, first and foremost, create authentic interprofessional experiences in which learners from different professional programs work together to solve a single, real-world clinical problem. They then ensure that all activities provide learners the opportunity to study, practice, and evaluate fundamental interprofessional collaborative competencies

– communication, role clarification, and collaborative decision-making – within a safe and controlled educational environment. Also, they provide opportunities for learners to reflect constructively on their interprofessional experiences in order to derive actionable strategies and insights regarding collaborative practice.

There are a few different educational strategies for teaching physiotherapy, nursing, and pharmacy students together. One such educational strategy is simulation-based interprofessional education (IPE). This involves students practicing and learning from managing complex clinical cases with multiple, overlapping professions without real-world consequences. For example, students work together on a simulation of a senior patient with multiple chronic conditions, polypharmacy, and mobility issues. This requires pharmacy students to manage medication optimization, physiotherapy students to prevent falls and create a mobility plan, and nursing students to integrate and manage a care plan and conduct education with the patient.

Clinical interprofessional education places students from different professions together in real clinical placements. These placements are accompanied with interprofessional faculty supervision. These immersive experiences allow learners to see and learn from role models demonstrating effective collaboration for the care of real patients. There is tremendous educational value for physiotherapy, nursing, and pharmacy students during interprofessional clinical placements in rehabilitation centres, geriatrics units, and chronic disease management collaborative clinics.

To maintain and further develop collaborative competencies throughout one's career, interdisciplinary education (IPE) is essential to advanced continuing education (CE) programs. IPE initiatives for practicing physiotherapists, nurses, and pharmacists offer experienced practitioners the chance to update their knowledge regarding other collaborating professions, communication skills, and new models of collaborative practice. Interprofessional Continuing Professional Development (CPD) programs increase the intention of healthcare practitioners to collaborate with other practitioners and increase their awareness of the patient perspective.

Clinical Applications of Interprofessional Collaboration

Pain Management

Chronic pain conditions can bring together professionals in physiotherapy, nursing, and pharmacy for their first partnership. Each profession on their own cannot resolve the issue, as pain is one of the most complex ailments a person can endure. It consists of biological, psychological, and social aspects, so multi professional collaboration is needed. pncm.bmj The biopsychosocial model is the theoretical underpinning of the pain management. This model examines the interplay of tissue damage, nervous system thickening, and psychological catastrophizing, depression, and social work disability, depression, and social work disability, and family relationships. The interprofessional pain management teams utilize this model by addressing multiple pain mechanisms and psychosocial pain simultaneously. pain nursing

Optimization of analgesic therapy, monitoring analgesics for adverse effects, and medication related problem solving is done by the inter professional teams. Implementation of strategies concerning reduction of opioids while maintaining pain control is also done. Evidence shows that pain management programs without a pharmacist are unsafe and unprofessional. Patient opioid misuse is also a high risk area that pharmacists manage and helped implement opioid stewardship. Managed transitions to non- opioid pain therapy also facilitate this. onlinelibrary.wiley

Death is a pain management physiotherapist and educator with expertise in non-pharmaceutical interventions, including therapeutic exercise, manual therapy, and functional rehabilitation.

Physiotherapy has been shown to help patients with chronic pain conditions by lessening the amount of pain felt and by gaining the ability to function and live better. One of the central features of these forms of therapy is the focus on the central mechanisms of pain and the dysfunctional patterns of movement that lead to chronic pain.

As part of interprofessional pain teams, nurses do enter assessments of the patients that include the use of validated pain scales, and implement pain management strategies and educational sessions focused on pain and self management, which they coordinate with their other team members. The nursing role has a dual nature, with medicinal and evaluative aspects such as pain and the provision of chronic pain psychosocial support to the patient. Interprofessional pain management clinics demonstrate the successful combination of physiotherapy, nursing, and pharmacy. Within the clinics, the patients receive a detailed assessment from each team member, which is followed by the development of a personalized treatment plan that integrates medications, physical activities, and self-management education. The teams meet regularly to promote communication and to ensure the treatment plan can change as new information about the patient is made available. Research has shown that programs that include these different areas of study can produce a lower level of pain, better emotional and physical health, less use of health services, less use of opioids, and an overall improvement in a patient's quality of life.

Chronic Disease Management

Some of the long lasting and complex health conditions such as diabetes and heart related problems, chronic obstructive pulmonary disease and high blood pressure are big health concerns and are, therefore, extremely important to manage.

Cross-professional teams in chronic disease management achieve better results when compared to conventional methods. A systematic review focusing on chronic conditions interdisciplinary team-based approach showed higher degrees of self-management, better health outcomes, and increased efficiency in activities of healthcare providers and healthcare systems. Improved outcomes in self-management and health status can be attributed to the integrated and cohesive system of working the teams.

Pharmacists on chronic disease management teams perform medication therapy management, optimize medication strategies for therapy goals with minimal side effects, classify and rectify drug therapy problems, and monitor drug therapy interactivity. Healthcare pharmacists working in chronic disease management programs have proven effective and positive in improving patient medication adherence, lowering hospitalization rates, and improving various clinical outcomes such as diabetes glycemic control and hypertension blood pressure control.

In respiratory and cardiovascular disease, physiotherapists perform pulmonary and cardiac rehabilitation as well as the assessment of functional capacity and the prescription of exercises and the promotion of physical activity. There is consistent evidence that patients with chronic disease undergo physiotherapy, as it helps reduce symptoms, enhance life quality and exercise tolerance, and flatten the burden of disease by cutting down on hospital stays.

Nurses perform patient education, self-management support, symptom monitoring, through home visits or telehealth, and care coordination, and medication adherence activities. There is evidence that self-management support for chronic disease patients with nurse education has a positive impact on medication adherence and hospital readmission. There is evidence that patients with chronic disorders show higher participation in self-

care when they are subjected to nurse-led interventions. They also highlight the importance of face-to-face nurse-led visits, especially those combined with telephone follow-up, as a highly effective intervention for improving medication adherence.

To illustrate such an interprofessional team, in the sphere of heart failure management, the clinical pharmacist tailors the prescriptions for diuretics and other cardiac medications, ensuring they mitigate adverse effects. Meanwhile, the exercise physiologist prescribes and supervises the individualization of exercise rehabilitation as he/she/they oversee functional capacity. The registered nurse offers symptom monitoring, educates the patient on alarm symptoms that necessitate medical intervention, and integrates all aspects of the management plan. Routine meetings of the interprofessional management team enhance the communication and collaboration of all team members regarding the patient and the care delivered, as well as any changes in the patient's care.

Geriatric Care

Elderly patients experiencing multimorbidity, polypharmacy, functional decline, and complex social problems illustrate the need for collaborative teamwork from the disciplines of physiotherapy, nursing, and pharmacy integration. The intricacies of geriatric care involve the simultaneous management of chronic disease syndromes, the polypharmacy health care dilemma, functional decline and maintaining geriatric functional independence, and the psychosocial and cognitive health aspects of the patients.

There are significant advantages associated with Interprofessional teams for Geriatric care, including a decrease in falls, an improvement in functional status, medication safety, a decrease in hospitalizations, and an extended period before the patient requires placement in a nursing home. The geriatric patient's health status and independence are enhanced through multidisciplinary comprehensive assessment and collaborative health care planning.

The geriatric care team pharmacists conduct medication reviews to determine patients' potentially inappropriate medications, adverse effects, drug interactions, and opportunities for deprescribing. The elderly patients suffer from the unique problems of polypharmacy due to the age demographics, as well as the number of prescribers the patient has and the patient's medication burden. The adverse effects of polypharmacy are well documented and pharmacist interventions are associated with improvement in medication appropriateness and health care cost avoidance.

Physiotherapists identify and manage challenges with mobility, evaluating and addressing potential problems with falls, balance, and daily activities frequently seen in older individuals. With the help of physiotherapists, older adults can increase their independence and mobility while decreasing their risk of falls through participation in physio activities, including strength training and balance exercises, gait training, and home safety assessments. Physiotherapists help older adults with pain through alternative methods as opposed to analgesics that may be of inappropriate use and are therefore less likely to prescribe analgesics to older adults.

Evidence from case studies of interprofessional collaboration in geriatric care shows the synergistic effect of integrating physiotherapy, nursing, and pharmacy services. For instance, an elderly integrated care patient suffering from chronic pain, polypharmacy, and fall risk (a condition known as geriatric syndrome) was cared on by a family physician-pharmacist-physiotherapist team. The pharmacist pain optimized and reduced unnecessary polypharmacy; the physiotherapist initiated and complied with a comprehensive pain management and fall prevention program while coordination of team members ensured interprofessional communication and treatment adherence. After 4 months of

interprofessional collaborative care, the patient was able to gain profound improvements in pain control and overall functional independence and quality of life.

Rehabilitation Facilities

Having to provide nursing care, physiotherapy, and pharmacy services, rehabilitation settings offer a unique opportunity for collaborative interprofessional teamwork. Patients in rehabilitation for a stroke, orthopedic surgery, traumatic injuries, or other disabling conditions, will all require integrated rehabilitation focused on restoration of physical function, pain relief, medication management, complication prevention, and psychosocial rehabilitation.

Members of rehabilitation teams, such as physiotherapists, perform essential duties such as evaluating and managing the clinical manifestations of physical disabilities. Their work and diagnosis formulate functional limitations and the restrictions of activities. Assessments, clinical diagnosis, and treatment interventions in physiotherapy incorporate the areas of therapeutic exercise, mobilization, coordination and balance retraining, pain control, and the prescribing of assistive devices. Home exercise programs that enhance patient and family function, activity modification, and functional independence are also emphasized in physiotherapist patient and family education.

In rehabilitation settings, nurses are responsible for patient surveillance, administering medications, taking care of wounds, and attending to complications to offer preventative care. Accompanying nurses are patient educators, and they provide psychological support as well. Nurse's role in the team is to individually guide and supervise the daily care activities, promote interdisciplinary communication, and oversee the uniform application of the treatment protocols.

In rehabilitation, the role of the interdisciplinary teams of pharmacists encompasses the integration of medication, optimization of therapeutic regimens, consultations on pain management, and patient education regarding medications that are to be used during and after rehabilitation therapies. The integration of pharmacists into rehabilitation teams promotes the reduction of medication mistakes, promotes the prevention of adverse drug events, and ensures the attainment of efficient pain control, which in turn supports the patient in the rehabilitation process.

The work rehabilitation sector showcases the successful collaboration across multiple professions. Participants in the multifaceted interdisciplinary work rehabilitation programs had an 83.9% return to work post-program completion, in comparison to only 31.6% who were employed prior to entering the program. The program included the integration of physiotherapy for restoring the physical capacity required, occupational therapy for the completion of the work specific task, psychological therapy for the psychosocial barriers associated with return to work, and medical management with an optimization of medications. Patients with shorter duration of prior disability also had better outcomes which underscores the need for prompt interdisciplinary collaboration.

Benefits and Outcomes of Interprofessional Collaboration

Involvement of different health care profession scholarships such as physiotherapy, nursing and pharmacy, has shown remarkable improvement in the diverse parameters measuring quality of care in the health system. Having different studies that examined various dimensions of health care and health outcomes, have concluded on the fact that graduated inter professional collaboration with in the health system is effective.

Health outcomes of the patients.

At the level of patients receiving care, inter professional collaboration operates on a range of outcomes: improving the clinical outcomes, enhancing safety, improving the quality of care experience and empowering them on self management. Improvements of in clinical

outcomes include enhanced control of chronic conditions, reduction of symptoms, improvement in functionality and quality of life. An example is the improvement in glycemic control, blood pressure control and overall symptom control achieved in patients with chronic diseases, having Diabetes, Hypertension and Heart Failure, respectively. Interprofessional collaboration affects medication adherence, which is a challenge in every medical field. With better training, pharmacists explain medication details. With better training, nurses educate patients and provide follow-up. With better training, physiotherapists explain how medications at times are needed to achieve rehabilitation goals. All these trained professionals work together to achieve better understanding and adherence from patients to their treatments. Chronic illness patients medication adherence is improved with interprofessional programs including nurses and pharmacists.

Interprofessional programs improve patient reported outcomes and satisfaction. Patients report better satisfaction with healthcare when they receive coordinated care from several professionals. They report feeling more support in their healthcare and more confidence in their self-management and care from a diverse healthcare team. Interprofessional collaboration enables shared decision making at the point of care.

Chronic disease management requires self-management support and is enhanced through interprofessional collaboration. Patients achieving better long-term outcomes are those whom physiotherapists, pharmacists, and nurses worked together to support. With their combined training, patients gain better self-management skills when they receive support from every healthcare discipline.

Healthcare Provider Outcomes

Healthcare practitioners working with others in different professions experience greater satisfaction with their work, the work, the profession, and the effectiveness of their practices. Interprofessional collaboration. in working with other professions and their specialties, clinicians learn to make more appropriate referrals and consultations. Each professionals practice and work is enriched by the insights of colleagues in different specialties.

In interprofessional collaboration, role and responsibility clarification and mutual respect lead to the building of specialized teamwork skills and the lessening of professional isolation. In nurse, pharmacist, and physiotherapist teams, effective interprofessional communication and care coordination is achieved more easily and is more efficient when they understand, respect, and value each others contributions and their scope of practice. For complex and challenging patient cases, interprofessional teams of healthcare professionals can provide integrated cooperative complex problem solving and clinical decision making that is of higher quality than can be provided by single practitioners working in isolation.

Organizational and Health System Outcomes

At the organizational and health system levels, costs can be reduced and interprofessional collaboration can lead to better and more efficient use of available resources. Interprofessional team care is associated with decreased length of hospital stay. Rehabilitation patients are able to achieve their functional goals sooner and are able to be discharged earlier when coordinated care is provided by a team of physiotherapists, nurses, and other health professionals.

Rates of hospital readmission are lower when interprofessional collaborative care models are used. Care models employing pharmacists for medication reconciliation, nurses for patient education, and physiotherapists for outpatient rehab are more effective at ensuring preventable readmission reduction through comprehensive discharge planning. This translates to improved patient outcomes and lower costs for the health care system.

Emergency department visitations are less when patients are recipients of collaborative primary care. Team proactive interventions diminish the need for emergency care by controlling for outcomes that lead to complicated care or exacerbations.

Quality of care indicators are positively influenced by the presence of interprofessional collaboration. Care processes like appropriate prescribing, adherence to evidence based guidelines, and delivery of preventive care are positively influenced with interprofessional care coordination. Interprofessional collaboration also positively influences care outcomes by decreasing complication and death rates.

Barriers and Challenges to Interprofessional Collaboration

Although there is strong proof validating the need for interprofessional collaboration, there are still significant barriers to its implementation on an individual, organizational, and system basis. These barriers must be understood to design methods to facilitate the implementation of interprofessional collaborative practice.

Individual-Level Barriers

Within the individual professional tier, there is a significant barrier to effective interprofessional collaboration which is the absence of role clarity. When physiotherapists, nurses and pharmacists do not clearly define their scopes of practice and are not aware of the other members of their team, such in the case of role confusion, there is duplication of services and gaps in the delivery of care, and therefore, confusion. Research shows that role and leadership ambiguity are barriers that 68.6% of healthcare professionals encounter. When practitioners possess a professional identity and territoriality, barriers are not able to be overcome as they possess their own discipline-specific identity which creates a barrier to collaborative teamwork. Some professionals feel there is a loss of professional autonomy and unique identity which is interprofessional collaboration. This tribalism is described as reluctance to share decision-making, resistance to other professions providing their input, and protecting boundaries of their perceived professional boundaries.

Egalitarian collaboration is permeated by deeply entrenched hierarchical attitudes and power imbalances. Towards the top is the physician and at the bottom are the other healthcare professionals. This model is a norm in most healthcare settings, and is detrimental to the communication regarding the integration and collaboration of other professionals. The authority, income, and stature imbalances also affect more than half of healthcare professionals (53.3%) per one report.

The communication skills necessary for healthcare professionals to collaborate effectively are also lacking, as one more individual level barrier. Interprofessional collaboration is built upon communication skills, not limited to, but including active listening, constructive feedback, conflict management, and tailoring communication to the audience. A significant number of healthcare professionals report insufficient training in these interprofessional communication skills.

Inequity among a unit's staff fosters a breach in interprofession collaboration when employees exhibit a lack of focus on a unit's common goal. For example, when one of the unit's pharmacists focuses on the optimization of a patient's medication therapy, ignoring the functional implications of the exercises prescribed by the unit's physiotherapist(s), or when a physiotherapist trains a patient in prescribed intensive exercises and neglects the side effects of the medication that a unit's pharmacist prescribes, the unit will be working at a suboptimal level.

Barriers at the Organization Level

Despite the fact that a healthcare professional may have the right competencies and attitudes, organizational barriers stand in the way of collaborative efforts. Time is most often cited as a barrier, and it is also the most limited resource in most organizations. Healthcare professionals deal with a multitude of responsibilities during the day, and the time required for interprofessional meetings, collaborative care planning, and coordination of activities is often non-existent. Organizational systems and workflows designed for siloed care do not account for the additional time required for effective interprofessional collaboration.

Siloing of health professionals also creates barriers to collaboration. If physiotherapists, pharmacists, and nurses do not have a shared workplace, the opportunities for spontaneous interactions, informal consultations, and communication that are essential for relationship building will be limited. On the other hand, co-location of health team members fosters interprofessional collaboration as it allows for continuous informal communication.

Inaccessible boundaries within communication infrastructures and technologies have become a hallmark of many modern healthcare environments. Factors such as unoptimized electronic health record (EHR) systems and other forms of inter-professional communication hinder efficiency in several domains, including information sharing, decision documentation, and the monitoring of integrated care strategies. Absences of shared communication tools become even more pronounced impediments to relational collaboration in contexts where health care professionals are dispersed, and members work in different shifts.

Lax leadership and governance frameworks have a stagnating effect on relationships and collaborations across different health disciplines. Without adequate and supportive organizational policies, the absence of defined guidelines for desired collective behaviors, and leadership that visibly enacts and incentivizes team collaboration, inter-professional relationship integration will continue to be more aspirational and less functional. Such organizations are often unprepared for adequately supporting inter-professional collaboration because of the absence of primary inter-professional team leadership and governance frameworks that promote collaborative work.

Uncarried and Robed Several Health Professions Inconstitutes As Barriers And Impacts Such Fields Is The Absence of Agency. For instance, primary care practices without access to pharmacist services are unable to adopt and execute advanced medication management. Similarly, rehabilitation sectors without the proper expenditure on staffing for adequate physiotherapy are unable to deliver optimal functional restoration.

System-Level Barriers

At the health system level, insufficient interprofessional education creates obstacles by not equipping healthcare professionals to work together. When the education programs for physiotherapy, nursing, and pharmacy have siloed curricula, graduates will not have the opportunity to learn about different professions' roles or build competencies for collaboration and will therefore leave the programs unprepared for the workforce.

Models of payment and reimbursement do not promote interprofessional collaboration. Fee-for-service payment models that reimburse only physicians do not acknowledge or reward the work of pharmacy, physiotherapy, and nursing experts in collaborative care. This creates negative financial incentives for interprofessional care and inadequate funding for collaborative care.

Barriers to interprofessional collaboration where there are silos in regulations and scope of practice are where they are overly conservative in not allowing professionals to work to the full scope of their training. For example, if there are restrictions on pharmacists adjusting

dosages of medications, or physiotherapists ordering imaging studies they have firm clinical guidelines for, their absence of such regulations creates a significant barrier to the efficiency of interprofessional teams.

The absence of a well-established system and a clear structure to facilitate interprofessional collaboration are a source of obstacles. Healthcare organizations are left with no direction, no models, no best practices, and no guides for implementation to build and create fully functioning interprofessional teams which leads to inefficient and inadequate interprofessional collaborative practice.

The lack of an adequate Monitoring and evaluation framework in a system hampers the recognition of successful models of interprofessional collaboration and building of further interprofessional collaboration multi-activities. Without system Monitoring and Evaluation of interprofessional teams and their outcomes, health systems remain unable to know the successful, the gaps, and the value of interprofessional collaboration to the system's stakeholders.

Educational Approaches

Throughout the professional training continuum, robust interprofessional education must be implemented. Pre-licensure IPE should be introduced early in the physiotherapy, nursing, and pharmacy curricula and should be sustained throughout the curricula. Authentic patient care activities are more effective in experiential learning opportunities where students collaborate. Strong interprofessional practice models in clinical placements allow students to both observe and partake in effective collaboration.

Post-licensure interprofessional collaboration continuing professional development (CPD) sustains and elevates collaborative competencies across careers. Practicing professionals are supported to develop communication, role, and team skills through workshops, simulation, and practice-based learning. Organizations must allow professionals to engage in interprofessional CPD by providing protected time.

Organizational Strategies

Organizational leaders can successfully facilitate Interprofessional Practice (IPP) by demonstrating their commitment to the positive integration of IPP into the organizations' strategies. Such leaders must develop and communicate strong advocacy for IPP vision, contribute positive and adequate resources, construct policies that encourage working together, and demonstrate working together throughout their levels. Appointment of leaders or coordinators of IPP teams provides governance and accountability for each individual teams and their functions.

Setting up both physical and digital environments that promote and encourage collaborative working together can remove barriers that inhibit integration within IPP. Placing members of the same IPP teams in the same physical environments and settings, along with the scheduling of IPP team working meetings, and the introduction of digital platforms can lead to positive coordination and collaborative working together. Moreover, something as simple as shared informal settings such as break rooms can assist in building positive working relationships and informal consulting.

Putting in place standards to organize communication along with communication protocols simplifies and structures interprofessional communication. Communication frameworks that are well defined, such as SBAR (Situation-Background-Assessment-Recommendation) can contribute to the positive flow of communication in an organized manner. Use of shared documentation for care planning that all team members contribute to and can access is an important tool to ensure that care delivery is collaborative and organized. Interprofessional team meetings that are planned and scheduled with defined agendas can become effective platforms for collaboration and for making joint decisions.

Providing clear definitions of the roles and responsibilities of each individual can assist in prevent duplication of care activities, ensuring that all aspects of care are adequately covered, and in ensuring that each professional is fully utilized. Organizations must create clear and detailed definitions for each of the team members on the specific roles and responsibilities and the associated decision making authority. Process mapping of team collaborations can support in defining and clarifying roles while optimizing the flow of work

Recognition and reward systems that incorporate interprofessional collaboration, enhance behavioral reinforcement of the collaboration and interprofessional relationship competencies expected of the individual. Celebrating interprofessional collaboration within the organization, also publicly, motivates teams to sustained collaborative efforts and/pr src to interprofessional collaboration.

System-Level Strategies

For interprofessional collaboration to be sustainable, advocacy efforts must be directed towards funding models that support interprofessional collaboration. There are alternative payment models designed to support interprofessional collaboration by rewarding outcomes rather than individual services, which creates the financial incentive to work interprofessionally. Furthermore, integrated collaborative interprofessional practice is possible only when reimbursement systems are designed to recognize the contributions of all non-physician members of the collaborative interprofessional team.

A positive first step in support of the interprofessional collaboration initiative is the development and dissemination of evidence-based frameworks and tools such as guidelines, toolkits, and case studies that outline successful interprofessional collaboration in various contexts. These frameworks and toolkits should incorporate practical resources, such as team charter templates, communication guides, role description exemplars, evaluation tools, and case studies.

Advocacy for no barrier policies aimed at allowing professionals to fully practice to the scope of their education and training is removing of unreasonable impediments. Professional regulatory frameworks should be reviewed and amended for scope of practice to achieve interprofessional collaboration with reasonable regulations for patient safety.

Collaborative culture fostering across health systems requires ongoing attention of leadership at all levels. Interprofessional collaboration should be the explicit focus of system-wide policies, mission statements, and strategic plans. System level culture change for interprofessional collaboration can be supported by professional associations of physiotherapy, nursing and pharmacy through advocacy for interprofessional collaboration, establishment of interprofessional forums and guidelines for collaboration.

Future Directions

The area of interprofessional collaboration in physiotherapy, nursing, and pharmacy is developing and lagging in certain areas of collaboration. There are some areas of focus needed in this field that involve caregivers, educators, and practitioners.

More informed studies are needed in understanding interprofessional collaboration to develop effective outcomes for patient care. There is consensus in literature that collaboration in patient care leads to improved outcomes, but the collaboration benefits are yet to be understood. There is a need for studies that explain the mechanisms interprofessional relationships, partnership in and co-management of a patient care plan that leads to improved outcomes. These studies will provide a basis for developing specific strategies.

The use of collaborative technology for interprofessional collaboration is a new area. There is the potential of digital health, telehealth, and AI to integrate interprofessional care. There

is a need for studies that integrate other strategies such that technology is seen to support interprofessional relationships rather than replace them.

Global insights remain rudimentary on interprofessional collaboration within physiotherapy, nursing and pharmacy. The majority of such research is emerging from high income countries with established healthcare systems. The scope of interprofessional collaboration would greatly evolve with an understanding of its implementation in low resource settings, varying socio cultural contexts and integrated health service delivery.

There is a need to create and assess models of interprofessional practice for specific health care priorities. Interprofessional teams for integrated pain management and addiction services, management of long COVID and healthcare delivery for the homeless and other marginalised populations are examples.

There is a need for more nuanced methods to assess interprofessional collaborative competencies. Existing frameworks for evaluating collaborative practice competencies tend to focus on self-reporting rather than direct observation. Methods for assessing genuine interprofessional collaboration in real world clinical situations are needed to reinforce the evaluation of interprofessional competencies in practice and education.

CONCLUSION

Integration of physiotherapy, nursing, and pharmacy is the first change of its kind from siloed, disciplinary-specific services of health care delivery, to cohesive and integrated, patient-centered care. This review consolidates evidence of the impact and the value of collaborative interprofessional practice to health care, specifically, physiotherapists, nurses, and pharmacists. By leveraging and harmonizing efforts with managed collaboration, patients' health outcomes dramatically improve in the health and health system dimensions – their individual clinical effectiveness, their safety, care experience, and their ability to self-manage. There are health system efficiency and economic gains value.

There is a nexus of the theory of interprofessional collaboration, and the ever-evolving health system challenges that no one discipline has the capacity to tackle is the rise of chronic diseases, the aging of the populations, the challenges of complex multimorbidity, and the ever-present polypharmacy. There are multiple dimensions of the collaborative framework to the biopsychosocial model of health and illness, which multiple disciplines act upon. The foundation of interprofessional education aimed at the three disciplines of physiotherapy, nursing and pharmacy develops their collaborative practice competencies in seamless integrated interprofessional practice.

The field of interprofessional collaborative practice is vast. In chronic pain management, the outcomes are demonstrable, and significantly better, when there is integration of pharmacy, physiotherapy, and nursing, in comparison to any one discipline being involved. Each contributes in their areas of expertise – pharmacists' interventions, physiotherapists' non-pharmacological approaches, and nurses' ongoing assessment, and patient engagement.

Engagement of various professionals in chronic illness approaches optimizing medication, encouraging physical activity, and supporting self-management certainly proves beneficial. Collaboration of physiotherapy, nursing, and pharmacy services in integrated geriatric care of elderly patients with multimorbidity, polypharmacy, and functional decline illustrates such vulnerable populations needing this type of care. Rehabilitation settings evidenced even greater benefits from teamwork. physio-pedia+9

Even with favorable outcomes and ample data, there are still interprofessional collaborative frameworks in chronic illness care. Deficient role explanation, professional siloing, hierarchical imbalances, and poor communication are some individual factors. Lack of time, team members being physically isolated, inadequate communication channels, and minimal supportive leadership are some organizational factors. Educational systems being siloed, inflexible funding systems, and the absence of guiding frameworks are some of the systemic factors.

Comprehensive action applied at multiple levels is the only way to mitigate such challenges. Collaborative competencies are encouraged with educational measures at the organizational level such as robust interprofessional education before licensure and post licensure. Strong leadership, shared workspaces, structured communication, role clarity, and organizational recognition of interprofessional practice at the collective level are all supportive of such practices. Adaptable regulations, resource frameworks, quality metrics, and even funding systems all promote interprofessional practice and collaboration at the systemic level.

Interprofessional collaboration among physiotherapy, nursing, and pharmacy can potentially lead to great future outcomes. New directions may include in-depth studies on collaboration frameworks, scalability in implementation science, technologically supported collaboration, process models, and enhanced participation of patients and families. Other prospects include the worldwide tailored integration of interprofessional relations, specialized models to fit new priorities, advanced framework of target competencies, and thorough cost analysis.

The collaborations in physiotherapy, nursing and pharmacy will be critical, not optional, as the healthcare system continues to transition to value-based care focused on outcomes, quality, and patient experience. We will have to stop asking whether interprofessional collaboration will improve care to asking how we can do it. This marks an important maturation of the field. Transforming the delivery of healthcare requires interprofessional collaboration, and it's the responsibility of healthcare leaders, educators, policymakers, and clinicians to create the environment for this collaboration to flourish, to better address the complex needs of patients today.

References

1. National Center for Biotechnology Information (NCBI). (2024). "Interprofessional Collaboration" among Pharmacists and Other Healthcare Professionals. *PMC*, 11075915. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11075915/>
2. El Hadidi, S., et al. (2024). Pharmacy—Physiotherapy Interprofessional Education and Practice. *Hospital Pharmacy*, 59(5). doi:10.1177/00185787241280240
3. SAGE Journals. (2025). Pharmacy—Physiotherapy Interprofessional Education and Practice. *Hospital Pharmacy*. Retrieved from <https://doi.org/10.1177/00185787241280240>
4. National Center for Biotechnology Information (NCBI). (2024). Pharmacy-Physiotherapy Interprofessional Education and Practice. *PMC*, 11559938. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11559938/>
5. National Center for Biotechnology Information (NCBI). (2020). Nurses' practice in interprofessional pharmaceutical care in hospitals. *PMC*, 7282395. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7282395/>
6. Dove Medical Press. (2025). The Impact of Interdisciplinary Team-Based Care on the Care and Outcomes of Chronically Ill Patients. *Journal of Multidisciplinary Healthcare*.

Retrieved from <https://www..com/the-impact-of-interdisciplinary-team-based-care-on-the-care-and-outcome-peer-reviewed-fulltext-article-JMDH>

7. National Center for Biotechnology Information (NCBI). (2021). Interprofessional Education (IPE): A framework for clinical practice. *PMC*, 7873741. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7873741/>
8. National Center for Biotechnology Information (NCBI). (2023). Interprofessional collaboration within general practice pharmacists. *PMC*, 10031930. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10031930/>
9. Derrick, H. (2018). Interdisciplinary Healthcare Teams. *ScholarWorks at Grand Valley State University*, 14(1). Retrieved from <https://scholarworks.gvsu.edu/spnhareview/vol14/iss1/8/>
10. MGH Institute of Health Professions. (2024). Interprofessional Education in Healthcare: A Foundation in Health Professions. Retrieved from <https://www.mgh.edu/news-and-more/opinions/health-professions-education-effects/interprofessional-education-healthcare-foundation>
11. Escola de Enfermagem Anna Nery. (2024). Nurses in an interdisciplinary pain clinic. *EAN Journal*. Retrieved from <https://eajournal.org/article/10.1590/2177-9465-EAN-2024-0059en/pdf/ean-28-e20240059.pdf>
12. Lim, R., et al. (2019). Standard of practice in pain management for pharmacy services. *Journal of Pharmacy Practice and Research*. doi:10.1002/jppr.1550
13. PubMed. (2006). Multidisciplinary and interdisciplinary management of chronic pain. Retrieved from <https://pubmed.ncbi.nlm.nih.gov/16616276/>
14. Physiopedia. (n.d.). Multidisciplinary Care in Pain Management. Retrieved from https://www.physio-pedia.com/Multidisciplinary_Care_in_Pain_Management
15. SciELO Brazil. (2024). Nurses in an interdisciplinary pain clinic. *Escola Anna Nery*, 28. Retrieved from
16. National Center for Biotechnology Information (NCBI). (2020). Fostering Interprofessional Patient-centred Collaboration in Primary Healthcare. *PMC*, 7594731. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7594731/>
17. Oxford Academic. (2017). Nurse-pharmacist collaborative interventions for medication adherence in older adults. *Age and Ageing*, 46(5), 747-754. Retrieved from <https://academic.oup.com/ageing/article/46/5/747/3828400>
18. Pain Nursing Italian Online Journal. (2021). The role of the nurse in interdisciplinary chronic pain management. Retrieved from <https://www.painnursing.it/the-role-of-the-nurse-in-interdisciplinary-chronic-pain-management/>
19. Review of Diabetic Studies. (2024). Interprofessional Collaboration Between Medical And Nursing Professionals in Chronic Disease Management. Retrieved from <https://diabeticstudies.org/index.php/RDS/article/download/720/598/1724>
20. National Center for Biotechnology Information (NCBI). (2024). Nurse-Led Interventions for Improving Medication Adherence in Chronic Diseases. *PMC*, 11641167. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11641167/>
21. National Center for Biotechnology Information (NCBI). (2024). Facilitators and barriers to interprofessional collaboration in primary healthcare. *PMC*, 11348528. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11348528/>
22. Jabbar, S., et al. (2023). A Cross-Sectional Study on Attitude and Barriers to Interprofessional Collaboration in Hospitals Among Health Care Professionals. *INQUIRY: The Journal of Health Care Organization, Provision, and Financing*, 60. doi:10.1177/00469580231171014

23. National Center for Biotechnology Information (NCBI). (2023). A Cross-Sectional Study on Attitude and Barriers to Interprofessional Collaboration. *PMC*, 10184235. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10184235/>

24. PubMed. (2022). Interprofessional collaboration in primary care: facilitators, barriers, and outcomes. Retrieved from <https://pubmed.ncbi.nlm.nih.gov/35129041/>

25. National Center for Biotechnology Information (NCBI). (2021). An Overview of Reviews on Interprofessional Collaboration in Primary Care. *PMC*, 8231480. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8231480/>

26. National Center for Biotechnology Information (NCBI). (2022). Elder care: The need for interprofessional collaboration between family physicians, clinical pharmacists and Physiotherapists. *PMC*, 9730976. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9730976/>

27. National Center for Biotechnology Information (NCBI). (2019). Outcomes of an interdisciplinary work rehabilitation program. *PMC*, 7029322. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7029322/>

28. Winnipeg Regional Health Authority. (n.d.). Briefing 2—Barriers to Successful Interprofessional Teams. Retrieved from <https://www.mbs.ca/old/professionals/collaborativecare/files/IPHCTC-Briefing2.pdf>

29. National Center for Biotechnology Information (NCBI). (2020). Fostering Interprofessional Geriatric Patient Care Skills for Health Professions Students. *PMC*, 7780744. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7780744/>

30. Journal of Rehabilitation Medicine. (2012). Multidisciplinary team care in rehabilitation: An overview of reviews. *J Rehabil Med*, 44(11), 901-912. doi:10.2340/16501977-1040

1. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11075915/>
2. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11559938/>
3. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11559938/>
4. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7873741/>
5. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7873741/>
6. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7873741/>
7. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7873741/>
8. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11348528/>
9. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11348528/>
10. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11348528/>
11. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11348528/>
12. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11348528/>
13. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11348528/>
14. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11348528/>
15. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11348528/>
16. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11348528/>
17. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11348528/>
18. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11348528/>
19. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11348528/>
20. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11348528/>
21. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11348528/>

22. <https://pubmed.ncbi.nlm.nih.gov/16616276/>
23. <https://diabeticstudies.org/index.php/RDS/article/download/720/598/1724>
24. <https://academic.oup.com/ageing/article/46/5/747/3828400>
25. <https://.gov/articles/PMC7029322/>
26. <https://.mb.ca/old/professionals/collaborativecare/files/IPHCTC-Briefing2.pdf>
27. <https://pubmed.ncbi.nlm.nih.gov/39544836/>
28. <https://.gov/articles/PMC10031930/>
29. <https://eanjournal.org/article/10.1590/2177-9465-EAN-2024-0059en/pdf/ean-28-e20240059.pdf>
30. <https://pubmed.ncbi.nlm.nih.gov/35129041/>