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Research Article

Role of Nursing in the Rehabilitation of Patients with Musculoskeletal Disorders through Physical Therapy

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Abstract:

Nursing plays an indispensable and integrative role in the rehabilitation of patients with musculoskeletal disorders, serving as the critical link that optimizes and sustains the benefits of physical therapy. Through continuous holistic assessment, skilled pain and symptom management, and vigilant prevention of complications, nurses create a safe and enabling environment for functional recovery. Their unique position allows for the seamless translation of physical therapy prescriptions into daily practice, providing consistent reinforcement of therapeutic exercises and mobility techniques. Furthermore, nurses empower patients and families through comprehensive education on condition management, home exercise programs, and the use of assistive devices, fostering essential self-management skills. As collaborators, they ensure cohesive interdisciplinary communication with physical therapists and other team members, while their provision of psychological support and motivational strategies addresses key psychosocial barriers to recovery. By embodying the roles of clinician, educator, coordinator, and advocate, nursing practice ensures that rehabilitative care is patient-centered, continuous, and effective, ultimately enhancing functional outcomes, promoting independence, and improving the quality of life for individuals navigating the challenges of musculoskeletal disorders.

1. Introduction

Musculoskeletal disorders (MSDs) represent a pervasive and multifaceted global health challenge,

constituting one of the leading contributors to chronic pain, functional disability, diminished quality of life, and significant economic burden on healthcare systems and societies worldwide [1]. This broad spectrum of conditions encompasses pathologies affecting bones, joints, muscles, connective tissues, and surrounding structures, including but not limited to osteoarthritis, rheumatoid arthritis, fractures, spinal disorders (such as herniated discs and stenosis), tendonitis, ligament injuries, and post-surgical states following joint replacements or spinal fusions. The clinical manifestations are diverse, often presenting as pain, stiffness, swelling, reduced range of motion, muscle weakness, and impaired coordination, which collectively impede an individual's ability to perform activities of daily living (ADLs), engage in work, and participate in social and recreational pursuits [2].

Within this complex clinical landscape, rehabilitation emerges not merely as a supplementary service but as a fundamental pillar of comprehensive patient management. The primary goal of rehabilitation in MSDs is to restore, maintain, or maximize functional ability, promote independence, alleviate pain, and prevent secondary complications, thereby facilitating a successful return to an active and meaningful life [3]. Physical therapy stands as the cornerstone of this rehabilitative process, employing a scientifically-grounded arsenal of modalities, therapeutic exercises, manual techniques, and functional training tailored to the specific disorder and the unique needs of the patient. Physical therapists are experts in movement science, diagnosing movement dysfunctions and designing targeted interventions to address them [4].

However, the journey of rehabilitation is neither linear nor solely technical. It is a profoundly human experience marked by physical discomfort, psychological hurdles, motivational fluctuations, and the need for sustained behavioral change. This is where the role of nursing becomes not just relevant but indispensable. The contemporary nurse, particularly in orthopaedic, rehabilitation, rheumatology, and geriatric settings, transcends traditional boundaries of care. They are no longer passive implementers of medical orders but dynamic, advanced practitioners, coordinators, educators, and advocates who are integral to the rehabilitation team [5]. The nursing role is holistic, bridging the gap between the targeted, time-limited interventions of physical therapy and the continuous, 24-hour reality of the patient's experience.

The essence of effective rehabilitation lies in the seamless integration of physical therapy prescriptions into the patient's daily routine and overall care plan. Nurses are the consistent presence that ensures this integration. They operate at the critical intersection of medicine, therapy, and patient lived experience, providing the continuity essential for long-term success [6]. Their involvement begins at the initial assessment, continues through the vigilant monitoring of progress and complications, extends into the crucial domain of patient and family education, and culminates in the planning for sustainable self-management after discharge. The nurse’s understanding of pathophysiology, pharmacology, pain management, and psychosocial principles enriches the rehabilitative process, ensuring it is safe, patient-centered, and adherent to the broader medical objectives [7, 8].

2. The Multifaceted Role of the Nurse in the Rehabilitation Team

The nurse functions as the central hub within the interdisciplinary rehabilitation team, which typically includes physiatrists, physical therapists, occupational therapists, social workers, and sometimes psychologists or nutritionists. The nurse’s unique position, characterized by prolonged and consistent patient contact, affords a comprehensive view of the patient’s holistic response to therapy and overall health status. This role is operationalized through several key functions: continuous assessment, coordination of care, and direct support for physical therapy goals. Unlike other team members whose interactions may be episodic, the nurse’s ongoing surveillance is critical for detecting subtle changes—be they improvements or emerging complications—that could significantly impact the rehabilitation trajectory [9].

One of the primary nursing responsibilities is the meticulous and ongoing assessment of the patient's status. This goes beyond routine vital signs to include detailed pain assessment using validated scales, monitoring for inflammation (heat, redness, swelling), evaluating neurovascular status distal to injuries or surgeries (circulation, sensation, movement), and assessing skin integrity, particularly in immobilized patients or those using assistive devices. The nurse assesses functional capacity in the real-world context of the ward or home, observing how the patient transfers, ambulates, and manages personal care outside of structured therapy sessions [10]. These observations provide invaluable, real-time data that complement the physical therapist’s more focused motor evaluations. For instance, a nurse might notice a patient’s reluctance to use their affected

limb during morning hygiene, indicating persistent fear or pain that may not be as apparent in the therapy gym, thereby alerting the team to a barrier that needs addressing.

Furthermore, the nurse acts as the crucial link ensuring that the plans formulated in team conferences are executed cohesively. They communicate the physical therapist's recommendations regarding weight-bearing status, exercise regimens, and the use of orthoses or prostheses to all relevant staff and the patient themselves. They reinforce therapy principles during all interactions, ensuring consistency in the approach to movement, positioning, and activity modification across all shifts and caregivers. This coordination prevents mixed messages and ensures that every interaction with the healthcare system supports, rather than undermines, the rehabilitative effort [11].

3. Direct Nursing Interventions Supporting Physical Therapy

Nursing interventions are directly aligned with and supportive of physical therapy objectives, creating a continuous therapeutic environment. A paramount area is pain management. Effective rehabilitation is impossible if the patient is overwhelmed by pain; conversely, excessive fear of pain can lead to kinesiophobia (fear of movement), resulting in immobilization and loss of gains achieved in therapy. Nurses are experts in pharmacological pain management, administering analgesics in a timely manner, often strategically prior to scheduled physical therapy sessions to facilitate participation. They also employ a wide array of non-pharmacological techniques such as guided imagery, relaxation exercises, therapeutic touch, and the application of heat or cold packs as adjuncts to manage pain and muscle spasm, thereby directly enabling more productive therapy sessions [12].

Positioning and mobility are other critical domains. Nurses ensure proper body alignment and positioning in bed and chairs to prevent contractures, reduce pressure on vulnerable joints, and minimize swelling. They implement turning schedules for patients with limited mobility to prevent pressure injuries. More actively, nurses facilitate and supervise the practice of functional mobility throughout the day. They assist and encourage patients in performing the transfers (e.g., bed-to-chair, sit-to-stand) and gait exercises as taught by the physical therapist, providing safe supervision and assistance as needed. This constant reinforcement helps to transform isolated therapy exercises into ingrained, functional movements, promoting neuroplasticity and building patient confidence [13].

Monitoring for and preventing complications is a proactive nursing function that safeguards the rehabilitation process. Patients with MSDs, especially those post-surgery or immobilized, are at risk for deep vein thrombosis (DVT), pulmonary embolism, pneumonia, and urinary tract infections. Nurses implement prophylactic measures such as administering anticoagulants, encouraging ankle pump exercises, promoting lung expansion techniques (incentive spirometry), and ensuring adequate hydration. By preventing these serious setbacks, nurses protect the patient's overall health and ensure that rehabilitation can proceed without catastrophic interruptions [14]. Additionally, they monitor for signs of complications related to the MSD itself or its treatment, such as compartment syndrome, infection, or adverse reactions to medications like corticosteroids or disease-modifying antirheumatic drugs (DMARDs).

4. Patient and Family Education: Empowering for Self-Management

Education is arguably one of the most powerful and enduring interventions a nurse provides. The ultimate goal of rehabilitation is to equip the patient for independent self-management beyond the clinical setting. Nurses, with their trusting relationships and ongoing contact, are ideally positioned to deliver and reinforce this education. They translate complex medical and therapeutic instructions into understandable, actionable information tailored to the patient's literacy level, learning style, and cultural context [15].

A core educational topic is the disease process itself. Nurses explain the nature of the musculoskeletal disorder, the rationale behind treatment plans, and the expected course of recovery. This knowledge reduces anxiety and fosters realistic expectations, which is crucial for adherence. Furthermore, nurses provide comprehensive instruction on pain management strategies, including the safe use of prescribed medications (dosing, timing, side effects) and non-pharmacologic methods, empowering patients to take control of their symptoms [16].

Crucially, nurses are responsible for teaching and verifying competency in the therapeutic exercise program prescribed by the physical therapist. They ensure the patient and family can correctly perform home exercises, understand their purpose (e.g., strengthening, stretching, endurance), and know the appropriate frequency and intensity. They emphasize the importance of consistency while also teaching the critical skill of listening to one's

body—distinguishing between beneficial discomfort and harmful pain. Education also extends to the proper use, maintenance, and safety precautions for assistive devices like walkers, canes, or crutches, and for orthotic devices like braces or splints [17].

Finally, nurses prepare patients for the transition home or to a next level of care. They educate on activity modification, energy conservation techniques, ergonomic principles for work and home, and environmental adaptations to enhance safety and independence. This holistic education, delivered continuously and reinforced through demonstration and return demonstration, transforms the patient from a passive recipient of care into an active, informed partner in their own long-term rehabilitation [18].

5. Collaboration and Communication with Physical Therapists

The nurse-physical therapist relationship is a dynamic partnership founded on mutual respect, open communication, and shared goals. Effective collaboration is not automatic; it requires intentional effort and structured communication channels. Regular interdisciplinary team meetings are a formal venue for sharing assessments, setting goals, and planning care. However, much of the vital collaboration happens informally through daily conversations, shared documentation, and mutual consultation at the patient's bedside [19].

Nurses provide physical therapists with critical contextual information that can shape therapy sessions. For example, a nurse might report that a patient had a poor night's sleep due to pain, suggesting the therapist may need to modify the intensity of that day's session. Conversely, they might share that the patient successfully walked a longer distance in the hallway than before, indicating progress. The nurse can alert the therapist to changes in the patient's medical condition, such as new onset dizziness or increased swelling, which could affect safety during therapy. This flow of information allows the physical therapist to tailor sessions in real-time, making them safer and more effective [20].In turn, physical therapists communicate specific recommendations to the nursing staff. They detail weight-bearing restrictions, prescribe specific functional activities to practice on the ward, and outline precautions for mobilizing patients with particular conditions. The nurse's role is to integrate these prescriptions into the overall nursing care plan and ensure all staff are aware of them. This bidirectional communication ensures a unified front. When both the nurse and the physical therapist give the same instructions and encouragement regarding an activity or exercise, it reinforces its importance and increases patient compliance. This collaborative model minimizes fragmentation of care and maximizes the therapeutic impact of every interaction the patient has with the healthcare team [21].

6. Psychological Support and Motivational Strategies

The psychological dimension of recovering from a musculoskeletal disorder is profound and can significantly influence physical outcomes. Patients often experience a grief reaction for their lost abilities, anxiety about the future, frustration with the slow pace of recovery, and depression stemming from pain and disability. The nurse, as a constant and empathetic presence, is pivotal in providing psychosocial support and fostering resilience [22].

Nurses employ therapeutic communication skills to allow patients to express their fears and frustrations. Through active listening and validation, they help normalize these emotional responses. Beyond emotional support, nurses are skilled in employing motivational strategies grounded in theories such as the Transtheoretical Model (Stages of Change) and Motivational Interviewing. They help patients articulate their personal goals for rehabilitation—whether it is playing with grandchildren, returning to a hobby, or simply performing personal care independently—and consistently link the daily, often tedious, work of therapy to the achievement of those meaningful goals [23].

Nurses help patients break down overwhelming long-term goals into small, achievable short-term objectives. Celebrating these small victories—such as achieving a greater knee flexion angle or managing stairs with less assistance—is a powerful motivator. Nurses provide positive reinforcement, praise effort, and help patients reframe setbacks as temporary challenges rather than failures. By building a trusting relationship, the nurse becomes a source of encouragement and accountability, helping the patient maintain engagement and effort through the inevitable plateaus and difficulties of the rehabilitation process [24]. This psychosocial support is not a separate activity; it is interwoven with every clinical interaction, creating a therapeutic environment that addresses the whole person.

7. Advanced and Specialized Nursing Roles in Musculoskeletal Rehabilitation

The nursing contribution to musculoskeletal rehabilitation has evolved to include advanced and specialized roles that further deepen the integration with physical therapy. The Orthopaedic Nurse Certified (ONC) and the Rehabilitation Registered Nurse (CRRN) are credentials that denote specialized knowledge in these fields. These nurses possess an advanced understanding of musculoskeletal pathologies, surgical procedures, complex pain management, and advanced rehabilitation techniques [25].

Clinical Nurse Specialists (CNS) and Nurse Practitioners (NP) in orthopaedics or rehabilitation take on even more autonomous roles. They conduct advanced assessments, make diagnoses, order and interpret diagnostic tests, prescribe medications (including for pain and symptom management), and manage complex patient caseloads. An NP or CNS can adjust pain regimens to optimize therapy participation, manage post-operative complications, and provide expert consultation to the team. Their advanced practice capabilities allow for more seamless management of the medical aspects of care, freeing the physical therapist to focus intensely on functional restoration while ensuring both domains are perfectly synchronized [26].

Furthermore, nurses are increasingly involved in leading specific therapeutic interventions. For instance, nurses may run group education sessions on joint protection or pain neuroscience education. They may also be trained in specific modalities complementary to physical therapy, such as performing wound care for post-surgical incisions, managing complex orthopedic hardware, or administering injections (e.g., corticosteroid) under protocol. This expanded scope allows for a more efficient and comprehensive delivery of the rehabilitative program, with nurses acting as direct extensions of the therapeutic plan [27].

8. Challenges and Future Directions in Nursing Rehabilitation Practice

Despite its critical importance, the full integration of nursing into the rehabilitation paradigm faces challenges. Understaffing and high nurse-to-patient ratios in many settings can severely limit the time nurses have to engage in the proactive, education-intensive, and supportive activities described. When nurses are overwhelmed with fundamental tasks, the rehabilitative aspects of care are often the first to be deprioritized, reducing the continuity of therapeutic reinforcement [28].

A lack of specific training in rehabilitation principles for general nurses can also be a barrier. While specialty certifications exist, not all nurses working with MSD patients possess them. Incorporating core concepts of rehabilitation nursing—such as kinesiology, assistive technology, motivational strategies, and interdisciplinary collaboration—into basic nursing curricula and hospital orientation programs is essential to prepare all nurses for this role. Ongoing professional development is equally crucial [29].

The future of nursing in musculoskeletal rehabilitation is promising and points towards greater integration and technological innovation. Telerehabilitation and digital health tools offer new avenues for nurse involvement. Nurses can conduct follow-up video calls to monitor home exercise form, assess functional progress remotely, provide motivational support, and triage concerns. The use of wearable sensors to track mobility and activity levels can provide objective data that nurses can use to coach patients and communicate with physical therapists. Furthermore, the growing emphasis on value-based care and patient-reported outcomes (PROs) highlights the importance of the holistic, patient-centered care that nursing provides. Nurses are well-positioned to lead in assessing PROs and ensuring care aligns with what matters most to patients [30].

9. Conclusion

In conclusion, the rehabilitation of patients with musculoskeletal disorders through physical therapy is a complex, multidimensional endeavor that extends far beyond the confines of the therapy gym. It is a continuous process that permeates every aspect of the patient's daily experience. Within this process, the nursing profession emerges not as a supportive accessory but as the essential, cohesive force that binds the rehabilitative enterprise together. Through their roles as vigilant assessors, skilled clinicians, empathetic educators, and collaborative team members, nurses create the optimal environment for physical therapy to succeed. They manage the symptoms that could hinder participation, prevent the complications that could derail progress, educate for empowered self-management, and provide the psychological sustenance necessary for perseverance.

The synergy between nursing and physical therapy is the engine of effective rehabilitation. One provides the specialized technical expertise in movement restoration; the other provides the holistic, continuous framework that allows that expertise to be translated into sustainable, real-world function. To overlook or underutilize the nursing role is to overlook a fundamental determinant of successful patient outcomes. As healthcare continues to evolve towards more integrated, patient-centered, and outcome-driven

models, recognizing, supporting, and advancing the specialized role of nursing in musculoskeletal rehabilitation will be paramount. It is through this powerful partnership that patients are truly empowered to navigate the challenging journey from disability towards restored function, independence, and an enhanced quality of life.

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