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Physiotherapy in the Management of Chronic Pain: Insights from Recent Literature

Maram Ali Jasser[1], Rawan Abdullah Mohammad Alshehri[2], Amani Mohammad Sheikhein[3], Nouf Fahad Khawaji[4], Fatimah Mohammad Hussain Hakami[5], Wejdan Misfer Almones[6], Jawaher Abdulrahman Mahzari[7], Hadeel Abdulsalam Hamam[8], Munira Nasser Al-Shahrani[9]

Abstract

Chronic pain is a widespread and debilitating condition that affects millions globally, often resulting in reduced quality of life and significant socioeconomic burden. Physiotherapy has emerged as a cornerstone in the multidisciplinary management of chronic pain, offering a wide range of interventions tailored to individual needs. This review article explores recent literature on the efficacy, mechanisms, and evolving role of physiotherapy in managing chronic pain. It highlights various therapeutic approaches including exercise therapy, manual therapy, electrotherapy, and cognitive-behavioral strategies. Emphasis is placed on evidence-based practices, the integration of physiotherapy within interdisciplinary care models, and emerging innovations in technology-assisted rehabilitation. The findings support the critical role of physiotherapists in not only alleviating symptoms but also addressing the underlying functional and psychological components of chronic pain. Continued research and clinical innovation are vital to optimizing patient outcomes and ensuring holistic, patient-centered care.

Keywords: *Physiotherapy, Management, Chronic Pain, Literature*

Introduction

Chronic pain, defined as pain persisting for more than three months, presents a complex clinical challenge that extends beyond physical discomfort to encompass emotional, psychological, and social dimensions. According to the World Health Organization (2021), chronic pain affects approximately 20% of the global population and is a leading cause of disability worldwide. Unlike acute pain, which serves a protective biological function, chronic pain often lacks a clear etiology and persists despite tissue healing, thereby complicating diagnosis and treatment. Physiotherapy, a branch of rehabilitative health that focuses on restoring movement and function, has become increasingly central in addressing chronic pain. The profession has evolved from purely physical rehabilitation to a more comprehensive biopsychosocial approach.

[1] Physiotherapy, Khamis Mushait General Hospital, Khamis mushait
[2] Physiotherapy, Clinical specialist at zimmer Biomet, Khamis mushait
[3] Physiotherapy, Khamis Mushait General Hospital, Khamis mushait
[4] Physiotherapist, Al-Hemaylah Primary HealthCare Centre, Riyadh
[5] Physiotherapy, King Fahad Hospital Al Hofuf, Alhasa
[6] Physiotherapy, Ministry of health Central office, Riyadh
[7] Physiotherapy, National guard hospital Alahsa, Alahsa
[8] Physiotherapy, king Abdulaziz medical city Jeddah, Jeddah
[9] Physical Therapy, King Salman Hospital, Riyadh

Physiotherapists are now key players in pain management teams, utilizing a wide range of interventions that include exercise prescription, manual techniques, patient education, and cognitive-behavioral strategies.
The aim of this article is to review current research on the effectiveness and mechanisms of physiotherapy in managing chronic pain. By synthesizing recent findings, this review seeks to inform clinical practice, guide future research, and underscore the importance of individualized, evidence-based physiotherapy interventions within interdisciplinary frameworks.

Definitions and Types of Chronic Pain

Chronic pain is typically defined as pain that lasts or recurs for more than three months, exceeding the normal tissue healing time (Treede et al., 2019). It can be classified into several categories based on its origin and characteristics:

1. **Nociceptive Pain**: Arising from tissue damage or inflammation, commonly seen in conditions like osteoarthritis and rheumatoid arthritis.
2. **Neuropathic Pain**: Caused by damage to the nervous system, such as diabetic neuropathy or postherpetic neuralgia.
3. **Nociplastic Pain**: A newer category characterized by altered nociception without clear evidence of tissue damage or nerve injury, as seen in fibromyalgia (Kosek et al., 2016).
4. **Mixed Pain**: A combination of nociceptive and neuropathic mechanisms, often observed in complex clinical cases such as cancer pain.

Each type of chronic pain demands a unique treatment approach, making individualized care essential. Chronic pain is not solely a physical sensation but often interacts with mood, cognition, and social context, requiring a comprehensive, patient-centered approach to management.

Physiotherapy Modalities in Chronic Pain Management

Physiotherapy employs a variety of modalities to manage chronic pain, targeting both physical and psychosocial dimensions. Some of the most widely used methods include:

Exercise Therapy

Exercise is a cornerstone in the physiotherapeutic management of chronic pain. It includes aerobic training, strength exercises, stretching, and motor control activities. Regular physical activity has been shown to improve pain thresholds, enhance mood, and increase functional capacity (Geneen et al., 2017).

Manual Therapy

Techniques such as joint mobilization, soft tissue manipulation, and myofascial release are commonly used to relieve pain, improve mobility, and modulate central sensitization. Manual therapy is particularly effective for musculoskeletal conditions like low back pain and neck pain.

Electrotherapy

This category includes Transcutaneous Electrical Nerve Stimulation (TENS), Interferential Current Therapy (IFC), and Ultrasound Therapy. These modalities help modulate pain signals and enhance tissue healing, though their efficacy varies by condition and patient response.

Education and Self-Management Training

Patient education is a vital component in managing chronic pain. Educating patients about pain neuroscience, coping strategies, and lifestyle modifications empowers them to actively participate in their recovery process.

Cognitive-Behavioral Physiotherapy

Integrating cognitive-behavioral principles into physiotherapy helps patients manage fear-avoidance behaviors, catastrophizing thoughts, and other psychosocial factors that exacerbate chronic pain (Leeuw et al., 2007).

Each of these modalities can be used independently or in combination, depending on the patient's condition, goals, and preferences. Effective physiotherapy requires individualized assessment and continuous re-evaluation to adapt interventions over time.

Mechanisms of Action

Physiotherapy alleviates chronic pain through various physiological and psychological mechanisms. Exercise therapy enhances blood circulation, reduces systemic inflammation, and stimulates the release of endogenous opioids such as endorphins, which elevate pain thresholds. It also promotes neuroplastic changes that help "rewire" pain pathways, making the nervous system less reactive to pain stimuli.

Manual therapy may reduce pain via mechanical and neurophysiological effects, such as decreasing muscle tension, improving joint mobility, and influencing spinal cord reflexes. Techniques like joint mobilization can reduce peripheral nociceptive input and modulate central pain processing.

Electrotherapy modalities like TENS and IFC are believed to work through the gate control theory of pain, where non-painful stimuli "close the gate" to painful input. They also enhance local circulation and tissue healing.

Importantly, cognitive-behavioral approaches in physiotherapy target maladaptive thoughts and behaviors. Educating patients about pain mechanisms helps reduce fear, catastrophizing, and disability, shifting the focus from pain avoidance to functional recovery.

Evidence from Recent Literature

Recent literature strongly supports the effectiveness of physiotherapy in managing chronic pain, with growing emphasis on multimodal, technology-assisted, and individualized approaches. A 2025 multicenter randomized controlled trial from Sweden comparing physiotherapy, chiropractic care, a combined approach, and counseling for chronic low back pain found the integrated treatment to yield significant improvements in disability scores and cost-effectiveness, although the statistical power was limited due to small sample sizes. Similarly, a 2024 German study evaluating multidimensional physiotherapy for nonspecific low back pain observed no immediate benefit, but notable reductions in pain intensity emerged at 10 and 22 weeks, emphasizing the importance of sustained interventions. Telerehabilitation has also demonstrated strong potential; a 2024 meta-review of 28 studies concluded that remote physiotherapy is equally effective as in-person care in improving pain and function in chronic low back pain populations. Additionally, virtual reality (VR) has gained prominence as a complementary tool, with a 2024 systematic review highlighting its ability to reduce pain intensity, fear of movement,

and functional disability. Beyond the spine, studies on chronic knee and shoulder pain have shown similarly promising outcomes. For instance, a 12-month randomized controlled trial revealed that a multimodal physiotherapy program combining exercise, manual therapy, and pain education led to significant improvements in pain (VAS) and function (KOOS) for knee pain. A 2024 network meta-analysis on shoulder pain interventions found extracorporeal shock wave therapy (ESWT) to be most effective in reducing pain, while suprascapular nerve blocks (SSNB) enhanced range of motion. In cases of chronic neck pain, a meta-analysis of 18 studies reported moderate evidence that exercise-based physiotherapy improves pressure pain thresholds over time, suggesting long-term neuromodulatory effects. Innovative and technological interventions further enhance these outcomes. A 2025 online pilot program using Pain Danger Signal Reprocessing (PDSR) demonstrated large effect sizes for pain reduction and functional improvement. Meanwhile, integrating physiotherapy with smart spinal cord stimulation systems showed clinical improvement in over 85% of patients, and Kinect-based tele-physiotherapy systems enabled real-time feedback and higher adherence in remote settings. Collectively, these findings highlight that evidence-based, patient-tailored physiotherapy—particularly when integrated with education, psychological support, and digital tools—offers substantial benefits in managing chronic pain. However, further large-scale studies with standardized protocols are needed to confirm and refine these emerging practices.

Challenges and Barriers

Despite strong evidence, several barriers hinder optimal use of physiotherapy in chronic pain care:

1. **Limited Access**: Especially in low-resource settings, rural areas, and among underserved populations.
2. **Inconsistent Practice**: Variability in the training and clinical practices of physiotherapists leads to inconsistent treatment quality.
3. **Patient Barriers**: Low adherence, psychological comorbidities (e.g., depression, anxiety), and fear-avoidance behaviors can limit the effectiveness of interventions.
4. **Health System Limitations**: Lack of reimbursement, limited session durations, and fragmented interdisciplinary coordination often prevent comprehensive physiotherapy plans.

Addressing these barriers requires both policy-level changes and increased investment in education, training, and integration of physiotherapy within pain care teams.

Role of Interdisciplinary Care

Physiotherapy is most effective when delivered within an interdisciplinary framework involving collaboration among physiotherapists, physicians, psychologists, occupational therapists, and nurses. This team-based approach ensures that all dimensions of chronic pain—biological, psychological, and social—are addressed.

Interdisciplinary care enhances treatment adherence, reduces opioid reliance, and improves long-term outcomes. For example, in multidisciplinary pain clinics, physiotherapists contribute not only by providing physical interventions but also by reinforcing psychological strategies and facilitating behavioral change.

The biopsychosocial model, now widely accepted in pain medicine, positions physiotherapy as an essential pillar in achieving patient-centered, holistic care.

Chronic pain presents a multidimensional challenge, significantly impacting quality of life and functioning. Physiotherapy has emerged as a central strategy in chronic pain management, emphasizing a biopsychosocial approach through exercise, manual therapy, education, and cognitive strategies.

While physiotherapy primarily targets the physical and functional aspects of chronic pain, recent literature underscores the growing importance of integrating nutrition as a complementary strategy that can modulate pain mechanisms, enhance recovery, and improve long-term outcomes (Tatta et al., 2022).

Integrating Nutrition with Physiotherapy for Chronic Pain Management

There is increasing global recognition of the critical role nutrition plays in the effective management of chronic pain, particularly when integrated into physiotherapy practice. According to Tatta et al. (2022), physiotherapists are uniquely positioned to assess and address the biopsychosocial dimensions of chronic pain, and integrating nutritional care into treatment plans can significantly enhance outcomes. Chronic pain is often associated with low-grade systemic inflammation, oxidative stress, and po...

Emerging evidence suggests that anti-inflammatory diets—rich in omega-3 fatty acids, fiber, antioxidants, and low in processed sugars—can help modulate pain pathways, improve mood, and reduce the need for pharmacological interventions. When combined with regular physiotherapy sessions, proper nutrition has been shown to reduce pain intensity, increase energy levels, and support tissue healing and recovery. For example, patients with fibromyalgia, osteoarthritis, or musculoskeletal pain have demonstrated ...
Integrating nutrition into physiotherapy care also aligns with broader goals of reducing medication dependency and minimizing drug-related side effects, which are common concerns in chronic pain populations. In this context, physiotherapists are encouraged to expand their clinical scope by collaborating with registered dietitians or receiving additional training in nutrition counseling.

Tatta et al. (2022) advocate for a paradigm shift in physiotherapy education and practice, promoting the use of multimodal lifestyle interventions that incorporate nutrition as a standard component in chronic pain care. This approach not only supports primary and secondary prevention, but also enhances wellness and long-term resilience in individuals living with pain.

Key Benefits of Integrating Nutrition and Physiotherapy

- **Pain Reduction:** A well-balanced, anti-inflammatory diet can complement physiotherapy by reducing inflammation and pain sensitivity.
- **Improved Quality of Life:** Better nutrition contributes to improved energy, sleep, mobility, and overall well-being.
- **Reduced Medication Use:** Patients may experience fewer side effects and lower dependency on pain medications.
- **Empowered Self-Management:** Encouraging dietary change enhances patient engagement in their own recovery journey.

Future Directions

The future of physiotherapy in chronic pain management is promising, with innovations driving better access, personalization, and efficacy. Key trends include:

- **Digital Health & Tele-Rehabilitation:** Virtual physiotherapy sessions, mobile applications, and wearable devices are enabling remote monitoring and individualized care.
- **Virtual Reality (VR):** VR-based interventions are being explored to reduce pain perception, particularly in complex pain conditions like CRPS and phantom limb pain.
- **Precision Rehabilitation:** Using genetics, biomechanics, and psychosocial profiling to customize physiotherapy protocols to each patient's unique needs.
- **Interdisciplinary Education:** Training physiotherapists in basic psychological interventions and pain neuroscience will enhance their ability to address the multidimensional nature of chronic pain.

More longitudinal studies are needed to assess the long-term outcomes of various physiotherapy strategies and their integration with other treatment modalities.

Conclusion

Physiotherapy is a central component in the management of chronic pain, addressing both physical impairments and psychosocial contributors to pain. It offers a range of evidence-based interventions—exercise, manual therapy, electrotherapy, and education—that, when tailored to individual needs, lead to meaningful improvements in pain and function.

While challenges remain in terms of access, consistency, and system-level support, the expanding role of physiotherapy within interdisciplinary, patient-centered care models is well-supported by recent literature. Future developments in technology, training, and research will further enhance its effectiveness and accessibility, reinforcing its position as a cornerstone of chronic pain management.

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