

Physiotherapy Interventions for Ankle Sprain Recovery: A Narrative Review Evidence-Based Physiotherapy Interventions for Ankle Sprain Recovery: A Narrative Review

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Abstract

Ankle sprains are one of the most common musculoskeletal injuries seen in both athletic and non-athletic populations. While traditionally treated with rest, ice, compression, and elevation (RICE), recent advancements in physiotherapy have introduced a range of novel approaches aimed at accelerating recovery, reducing recurrence rates, and optimizing functional outcomes. This comprehensive review synthesizes current literature on the physiotherapy management of ankle sprains, encompassing assessment strategies, therapeutic interventions, and rehabilitation protocols. Drawing upon evidence-based practices, this review highlights emerging trends and innovative techniques in the field, providing clinicians with a contemporary framework for the effective management of ankle sprains.

Introduction

Ankle sprains represent a prevalent musculoskeletal injury found in both athletic and non-athletic groups, with substantial implications for global morbidity and healthcare expenses ^{1, 2}. Despite being common, the most effective management strategies for ankle sprains are still under continuous research and discussion. Physiotherapy interventions are pivotal in the rehabilitation process, aiming to restore function, alleviate pain, and minimize the likelihood of recurrence.

This comprehensive review aims to synthesize the existing evidence on various physiotherapy interventions utilized in the

management of ankle sprains. Drawing upon a wide range of peer-reviewed literature, including randomized controlled trials, systematic reviews, and meta-analyses, we provide a comprehensive overview of the efficacy, safety, and comparative effectiveness of different physiotherapy modalities.

The review delves into fundamental aspects of physiotherapy interventions, encompassing early mobilization ³, manual therapy techniques ⁴, therapeutic exercises ⁵, neuromuscular training ⁶, proprioceptive training ⁷, as well as modalities such as ultrasound and electrical stimulation ⁸, and

supplementary treatments like taping and bracing.⁹ Emphasis is placed on understanding the underlying mechanisms of action, patient selection criteria, optimal timing, and dosage of interventions. Furthermore, this review discusses the challenges and controversies surrounding the evidence base for physiotherapy interventions in ankle sprain management, including heterogeneity in study designs, outcome measures, and patient populations. By critically appraising the current literature, we aim to provide clinicians, researchers, and policymakers with a comprehensive synthesis of the available evidence to inform clinical decision-making and guide future research directions.

Methodology

A systematic search was conducted using electronic databases including PubMed, MEDLINE, and Google Scholar. Keywords such as "ankle sprain," "physiotherapy," "rehabilitation," and "treatment" were used to identify relevant studies published in peer-reviewed journals. Studies focusing on physiotherapy interventions for ankle sprains, including randomized controlled trials, systematic reviews, and meta-analyses, were included.

Physiotherapy intervention

1. Initial Assessment and Diagnosis:

It typically begins with a thorough assessment to determine the severity of the injury, identify associated factors such as muscle weakness or imbalance, and tailor treatment plans accordingly. Diagnostic tools such as the Ottawa Ankle Rules aid in accurately diagnosing the extent of ligament damage, guiding subsequent interventions.¹⁰

2. RICE Protocol:

The primary approach in managing acute ankle sprains, the Rest, Ice, Compression, and Elevation (RICE) protocol, is frequently implemented soon after injury to alleviate pain and swelling. Nonetheless, recent studies propose that incorporating early mobilization alongside RICE could improve results, highlighting the significance of gradual activity and functional recovery.¹¹

3. Manual Therapy:

Manual therapy techniques, including joint mobilizations and soft tissue manipulation, are frequently employed to improve ankle joint mobility and proprioception. Studies have demonstrated the efficacy of manual therapy in reducing pain and enhancing functional outcomes in individuals with ankle

sprains, particularly when combined with exercise therapy.¹²

4. Exercise Rehabilitation:

Exercise-based rehabilitation forms the crux of ankle sprain management, focusing on restoring strength, flexibility, and neuromuscular control. Proprioceptive and balance exercises, such as wobble board training and single-leg stance exercises, are instrumental in improving ankle stability and reducing the risk of recurrent sprains.¹³

5. Functional Training:

Integrating functional activities into rehabilitation programs is essential for facilitating the transition from recovery to return to activity or sport. Task-specific exercises, such as agility drills and plyometrics, challenge dynamic stability and enhance movement patterns, ensuring optimal functional outcomes.¹⁴

6. Bracing and Taping:

External supports, such as ankle braces or taping techniques, may be employed during the rehabilitation phase to provide additional stability and proprioceptive feedback. While temporary bracing can aid in injury protection, long-term reliance should be discouraged to promote intrinsic muscle strength and joint proprioception.¹⁵

7. Patient Education and Psychosocial Support:

Empowering patients with knowledge about injury prevention strategies, rehabilitation progressions, and self-management techniques is integral to successful outcomes. Additionally, addressing psychosocial factors such as fear of re-injury or anxiety through education and motivational interviewing enhances compliance and overall satisfaction with physiotherapy interventions.¹⁶

No.	Physiotherapy Intervention	Dosage
1	Initial Assessment and Diagnosis	Clinical assessment using pain scale, ROM, ligament tests; apply Ottawa Ankle Rules within 24–48 hrs post-injury.
2	RICE Protocol	Rest 24–72 hrs ; Ice 15–20 min every 2–3 hrs ; Compression continuously; Elevation 20–30 min several times/day for 48–72 hrs .
3	Manual Therapy	Joint mobilization 3–5 sets × 30–60 sec , 3–4 sessions/week for 2–3 weeks .

4	Exercise Rehabilitation	Strengthening 2–3 sets × 10–15 reps, 3–5 days/week ; Balance training 20–30 min, 3–4 days/week for 4–6 weeks .
5	Functional Training	Agility/plyometric drills 15–20 min, 3 sessions/week for 3–4 weeks .
6	Bracing and Taping	Brace/tape during activity for 4–6 weeks post-injury.
7	Patient Education	Home exercise program 15–20 min daily for 4–8 weeks .

Table 1: physiotherapy interventions for ankle sprain along with the dosage for each intervention

Discussion

The comprehensive review of physiotherapy interventions for ankle sprain recovery underscores the evolving landscape of treatment strategies aimed at enhancing outcomes and minimizing recurrence rates. By synthesizing evidence from recent studies and established practices, this discussion explores into the efficacy and implications of various intervention modalities.

Dowling S in 2009 states that Prompt and accurate assessment is critical in guiding appropriate management strategies for ankle sprains. The utilization of clinical decision rules such as the Ottawa Ankle Rules has demonstrated high sensitivity and specificity in ruling out fractures, thereby aiding in the timely initiation of physiotherapy interventions.¹⁰ Moreover phan et al in 2021 mentioned that advanced imaging modalities, including ultrasound and MRI, offer valuable

insights into the extent of ligamentous damage, facilitating targeted treatment planning and prognostication.¹⁷

Bleakley et al in 2012 Contended that While the RICE protocol has long been considered standard practice in the acute management of ankle sprains, recent evidence suggests a paradigm shift towards early mobilization and activity-based interventions. Meta-analyses have shown that the addition of early mobilization to RICE leads to faster recovery, improved function, and reduced disability compared to immobilization alone. This highlights the importance of promoting movement and functional rehabilitation from the outset, while still addressing pain and swelling through adjunctive measures.¹⁸

Punt et al (2016) stated that the integration of manual therapy techniques and exercise-based rehabilitation forms the cornerstone of ankle sprain rehabilitation. Manual therapy, including joint mobilizations and soft tissue techniques, has been shown to improve ankle range of motion, reduce pain, and enhance proprioception.¹⁹ Concurrently, structured exercise programs targeting strength, flexibility, and neuromuscular control play a pivotal role in restoring functional stability and preventing re-injury.²⁰ Emphasis on progressive loading and task-specific exercises tailored to individual patient needs fosters optimal tissue healing and functional adaptation.²⁰

Gribble et al., in 2020 concluded that the transition from rehabilitation to return to activity or sport necessitates the integration of functional training principles. Incorporating sport-specific drills, agility exercises, and proprioceptive challenges into rehabilitation protocols simulates the demands of real-world activities and enhances dynamic stability. This phased approach to rehabilitation not only facilitates safe return to play but also mitigates the risk of secondary injuries by ensuring adequate neuromuscular adaptation and motor control.

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Delahunt et al., in 2018 mentioned that Patient education emerges as a crucial component of rehabilitation, empowering individuals with self-management strategies, injury prevention techniques, and realistic expectations for recovery.²² Gould et al., (2015) Addressing psychosocial factors and promoting patient engagement fosters adherence to treatment plans and facilitates positive long-term outcomes.²³

Conclusion

In conclusion, the comprehensive review underscores the multifaceted nature of physiotherapy interventions for ankle sprain recovery, encompassing assessment, therapeutic modalities, and injury prevention and patient-centered care. By integrating evidence-based practices and individualized treatment approaches, clinicians can optimize outcomes, minimize disability, and promote a timely return to functional activity for individuals affected by ankle sprains. However, individualized treatment plans tailored to the specific needs and goals of each patient remain paramount in achieving successful rehabilitation.

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