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Short Communication

Ankle instability and physiotherapy: Exploring novel rehabilitation approaches

Alagappan Thiyagarajan[1], S. Jeyakumar[2]*, Rajan Balakrishnan[3]

[1]*Dept. of Sports Medicine, Chettinad University, Kelambakkam, Tamil Nadu, India*
[2]*Garden City University, Bengaluru, Karnataka, India*
[3]*MAHSA University Malaysia, Selangor, Malaysia*

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ABSTRACT

A common ailment that affects many people, especially athletes, ankle instability is frequently brought on by acute injuries that result in long-term pain and functional restrictions. This article examines both cutting-edge techniques like neuromuscular training, sport-specific drills, and technology-enhanced rehabilitation as well as more conventional approaches like strength training and balance exercises. Physiotherapists can develop customised regimens that enhance recovery results and lower the chance of re-injury by combining these tactics. Validating these novel approaches and improving rehabilitation procedures require ongoing research.

1. Introduction

People of all ages are susceptible to ankle instability, which is particularly problematic for athletes. This illness, which is frequently brought on by acute ankle sprains, can cause persistent discomfort, frequent injuries, and functional impairments that affect both everyday living and athletic performance. Strength training and balancing exercises have been the mainstays of traditional rehabilitation techniques, but new treatments that might speed up recovery and better patient outcomes are becoming more and more necessary. This article examines the latest developments in ankle instability physiotherapy, emphasising cutting-edge methods including sport-specific drills, neuromuscular training, and technology-enhanced rehabilitation.[1] When the ligaments supporting the ankle joint are weak, usually as a result of an earlier injury, ankle instabilityresults.[1] This condition is typically classified into two categories: functional instability, which involves a subjective feeling of instability without significant structural damage, and mechanical instability, characterized by measurable joint laxity. Both types can lead to a decreased quality of life, increased risk of further injuries, and limitations in physical activities.

1.1. Traditional approaches

The main goals of traditional rehabilitation for ankle instability are to improve balance, restore range of motion, and strengthen the muscles surrounding the ankle. Stretching exercises to improve flexibility, balancing exercises like single-leg stands, and weight training to target the peroneal muscles are common methods. Restoring the stability and proprioception required for safe movement is the goal of these techniques. Traditional methods, although beneficial for many individuals, frequently fall short in addressing the intricate interactions between the various elements that lead to ankle instability, hence a move towards more creative techniques is required.[2]

* *Corresponding author*.
E-mail address: jeysubikshaa@gmail.com (S. Jeyakumar).

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1.2. Novel approaches

Innovative rehabilitation methods for ankle instability place an emphasis on a more thorough and dynamic view of healing. One of the most important techniques is neuromuscular training, which improves coordination and stability by strengthening the brain-muscle link through dynamic balancing and agility tasks. Sport-specific drills help athletes return to performance more smoothly by customising rehabilitation to meet the particular demands of their athletic endeavours. Furthermore, wearable sensors and virtual reality settings used in technology-enhanced rehabilitation offer engaging practice situations and real-time feedback, improving results and patient motivation.[3]

1.3. Integrating approaches

Ankle instability can be managed more holistically by combining cutting-edge and conventional rehabilitation techniques. Physiotherapists can create customised programs that incorporate strength and balance exercises with cutting-edge methods like neuromuscular training and kinesiology taping by carrying out comprehensive evaluations. This connection makes it possible to load exercises gradually, increasing their complexity and intensity to boost functionality and confidence. When medical specialists work together, the rehabilitation process is further enhanced and all facets of a patient's recovery are taken care of, which eventually improves results and lowers the chance of re-injury.[4]

2. Discussion

Because ankle instability is a complex issue, managing it calls for a multimodal strategy that combines cutting-edge and conventional rehabilitation techniques. Though they have long been the cornerstone of function restoration and re-injury prevention, traditional techniques like strength training and balancing exercises could not adequately address the psychological aspects of fear of re-injury or the dynamic nature of sporting activity. By emphasising coordination, proprioception, and real-time feedback, innovative techniques like neuromuscular training and technology-enhanced rehabilitation provide notable improvements and increase patient motivation and engagement. Physiotherapists can design customised programs that address each patient's unique needs by combining these cutting-edge methods with tried-and-true methods, which will speed up healing and lower the chance of recurrent injuries. Furthermore, collaboration among multidisciplinary healthcare teams can optimize treatment outcomes by addressing physical, psychological, and functional aspects of recovery. Ongoing research is crucial to validate the effectiveness of these integrated approaches, refine rehabilitation protocols, and ultimately improve the quality of life for individuals suffering from ankle instability.[5,6]

Ankle instability not only affects physical performance but also has psychological implications that can hinder recovery. Fear of re-injury can lead to decreased activity levels and avoidance behaviors, which may exacerbate functional limitations. Incorporating psychological support, such as cognitive-behavioral strategies, can help patients manage their fears and improve their confidence in returning to sport. Additionally, addressing these psychological barriers through guided discussions and visualization techniques can enhance adherence to rehabilitation programs. A holistic approach that integrates mental health considerations with physical training is essential for fostering resilience and promoting a quicker, more effective recovery from ankle instability.Furthermore, patient education plays a critical role in the rehabilitation process. Informing patients about the nature of their injury, recovery timelines, and the importance of compliance with prescribed exercises can empower them and foster a sense of ownership over their recovery. Educational sessions can also clarify misconceptions about ankle stability, reducing anxiety and enhancing motivation. When patients understand the rationale behind their rehabilitation protocols, they are more likely to engage actively and consistently in their recovery. Therefore, incorporating educational components alongside physical and psychological interventions can significantly enhance overall treatment outcomes and ensure a comprehensive approach to managing ankle instability.[7]

3. Conclusion

Due to its complexity, ankle instability necessitates a thorough rehabilitation plan. While there is value in conventional techniques, newer strategies including neuromuscular training, sport-specific drills, technology-enhanced rehabilitation, and kinesiology taping present intriguing opportunities to boost results. By incorporating these cutting-edge methods, physiotherapists can improve recuperation, lower the chance of re-injury, and provide patients the confidence to resume their preferred activities. In order to validate these techniques and improve rehabilitation regimens for those with ankle instability, more investigation and clinical trials are necessary.

4. Source of Funding

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5. Conflict of Interest

None.

References

1. Bittencourt NF, Sampaio JE. Ankle instability: The role of neuromuscular training in rehabilitation. *J Athl Train.*

2018;53(10):935–40.
2. Doherty C, Hiller C. The effectiveness of balance training in the management of ankle instability: A systematic review. *Phys Ther Rev*. 2015;20(3):145–55.
3. Hertel J. Functional instability following lateral ankle sprain. *Sports Med*. 2002;32(5):289–304.
4. Kinzey SJ, Mccreary C. The effect of taping and bracing on ankle instability. *J Sports Rehab*. 2016;25(1):1–10.
5. Leanderson J, Hennings A. Virtual reality in rehabilitation of ankle instability: A pilot study. *J Neuro Eng Rehabil*. 2020;17(1):34.
6. Mckeon JM, Hertel J. Spatiotemporal characteristics of gait following ankle sprain. *J Ath Train*. 2008;43(3):290–6.
7. Rees JD, Tully T. Evidence-based strategies for the management of ankle instability: A review. *Brit J Sports Med*. 2017;51(22):1650–6.

Author's biography

Alagappan Thiyagarajan, Associate Professor

S. Jeyakumar, Research Supervisor

Rajan Balakrishnan, Lecturer

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