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Effect of Virtual Reality-based Proprioceptive Training for Chronic Ankle Instability: A Scoping Review

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ABSTRACT

Ankle injuries, including sprains and chronic ankle instability, can severely affect mobility and quality of life, often due to proprioceptive deficits that increase the risk of recurring injuries. Virtual reality (VR) programmes, by simulating real-life sensory experiences, have emerged as innovative tools for enhancing proprioceptive training and improving functional outcomes. This scoping review evaluates the effectiveness of VR-based therapies in preventing ankle injuries.

A systematic search of English-language articles published between 2015 and 2024 was conducted using databases like PubMed, The Cochrane Library and Pedro. Search terms included “virtual reality,” “proprioceptive training,” “ankle injury,” “ankle sprain,” and “chronic ankle instability,” combined using Boolean operators. The review focussed on randomised controlled trials examining the impact of VR therapies on balance, proprioception, and neuromuscular control related to ankle health. Six studies met the inclusion criteria.

Compared to traditional methods, VR therapies showed significant improvements ($P<0.05$) in proprioceptive accuracy and balance. By simulating dynamic, sport-specific tasks, VR enhanced functional training outcomes and boosted adherence to protocols through increased participant motivation. These findings suggest that VR-based proprioceptive training can reduce the risk of ankle injuries and improve balance, making it a promising complement to conventional prevention techniques.

Keywords: Ankle injuries, Ankle rehabilitation, Proprioception.