

Effects of Combination of Strength and Balance Training on Postural Control and Functionality in People with Chronic Ankle Instability: A Systematic Review and Meta-Analysis

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DESCRIPTION

Chronic Ankle Instability (CAI) is a prevalent condition that affects a significant portion of the active population, often leading to recurring sprains and long-term functional impairments. Recent research has focused on identifying effective rehabilitation strategies to improve outcomes for individuals with CAI. Among these strategies, strength training and balance training have garnered considerable attention. Our recent meta-analysis, encompassing 33 Randomized Controlled Trials (RCTs) and 1154 patients, provides robust evidence on the efficacy of strength and balance training in the management of CAI. The analysis revealed that both training modalities, individually and in combination, significantly improve patient-reported outcomes. Specifically, strength training (SMD=0.80), balance training (SMD=0.79), and the combination of both (SMD=1.28) showed substantial improvements compared to control groups. Interestingly, while balance training demonstrated significant benefits in dynamic balance as measured by the Star Excursion Balance Test (SEBT) in multiple directions (anterior: SMD=0.71; posterolateral: SMD=0.84; posteromedial: SMD=0.88), strength training and the combination of strength and balance training did not yield significant improvements in SEBT outcomes.

Implications for Practice

These findings underscore the importance of incorporating balance training into rehabilitation programs for individuals with CAI to enhance dynamic balance. The data suggests that strength training, while beneficial for patient-reported outcomes, should be used cautiously when the primary goal is to improve dynamic balance. Rehabilitation professionals should consider a tailored approach that integrates balance training as a cornerstone of the rehabilitation process for CAI.

Short-term Prognosis

In the short term, individuals who undergo a comprehensive rehabilitation program often experience a significant reduction in symptoms. Physical therapy can restore strength, balance, and range of motion, leading to improved stability and function. Non-surgical treatments are typically effective for mild to moderate cases of CAI.

Long-term Prognosis

In the long term, the prognosis for CAI can be more variable. While many individuals successfully manage their symptoms with non-surgical treatments, others may continue to experience instability and recurrent sprains. For these individuals, surgical intervention may be necessary to achieve lasting stability. Even after surgery, ongoing preventive measures, such as regular strength and balance training, are essential to maintain ankle health and prevent recurrence.

Impact on Quality of Life

CAI can have a significant impact on an individual's quality of life, particularly for those who are physically active or participate in sports. The recurrent nature of the instability can lead to chronic pain, swelling, and a reduced ability to engage in physical activities. This can result in frustration, decreased performance, and a reduced sense of well-being. The psychological impact of CAI should not be underestimated. Chronic pain and the fear of recurrent sprains can lead to anxiety and reduced confidence in one's physical abilities.

CONCLUSION

Our study highlights the critical role of combination of strength and balance training in the effective management of chronic ankle instability. It is important for individuals with CAI to receive not only physical but also psychological support to help

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them cope with the condition and maintain a positive outlook. By refining rehabilitation strategies to prioritize dynamic balance improvement, clinicians can significantly enhance the quality of life and functional outcomes for patients with CAI.

FUTURE DIRECTIONS

Further research is needed to explore the underlying mechanisms through which balance training enhances dynamic balance and to identify the optimal combination and sequencing

of strength and balance exercises. Additionally, investigating the long-term effects of these training modalities on recurrence rates of ankle sprains and overall functional recovery would provide valuable insights. With appropriate treatment and rehabilitation, many individuals with CAI can return to their normal activities without significant limitations. However, the prognosis can vary depending on several factors, including the severity of the instability, the individual's adherence to rehabilitation programs, and the presence of any underlying conditions.