



The effects of jump training on preparatory activity of thigh muscles in female athletes with dynamic knee valgus during single leg landing

Oral Presentation

1Farzaneh Saki * ; 2Moharam Rozbeh; 2Hamid Seifi; 1Farzaneh Ramezani

¹Department of Corrective Exercise and Sport Injury, Faculty of Sport Sciences, Bu-Ali Sina University, Hamadan, Iran
(f_saki@basu.ac.ir)

²Hamadan Sport and Youth Office, Hamadan, Iran

Abstract

Introduction: Dynamic knee valgus (DKV) is a movement pattern in the lower limb that is potentially a combination of adduction and internal rotation of femur, knee abduction, anterior tibial translation, external tibial rotation, and ankle eversion. DKV is one of the predisposing factors for acute and chronic injuries, such as non-contact ACL injury and patellofemoral pain syndrome. Plyometric jump training is characterized by exercises that leverage the stretch-shortening cycle of the muscle. Plyometric jump exercises can be conducted with short (250 ms) or long ground contact times (i.e., fast or slow stretch-shortening cycle durations). Therefore, this study aimed to determine the effects of jump training with real time feedback on preparatory activity of thigh muscles in female with DKV.

Methods: In this randomized and controlled trial, 26 female athletes with DKV angle greater than 12° were selected. Athletes were divided into two groups groups; training (n = 13), and control (n = 13). The jump training was carried out by training group. The following measures were taken before and after interventions: preparatory activity of gluteus maximus (GMax), gluteus medius (GMed), tensor fasciae latae (TFL) and adductor longus (AL) at 100ms before foot contact.

Results: Athletes in the training group demonstrated increased preparatory activity of GMax and decreased preparatory activity of AL during single-leg landing following the intervention ($p \leq 0.05$). Preparatory activity of GMed and TFL were not significantly different after training.

Conclusion: Plyometric training with real-time feedback beneficially mitigate ACL injury neuromuscular risk factors and should be emphasized on use of these exercises during the athlete preparation program for competitions.

Keywords

Preparatory activity; ACL injury; Jump training; DKV

Reference:

- Ellenberger, L., Casutt, S., Fröhlich, S., Frey, W. O., Snedeker, J. G., & Spörri, J. (2021). Thigh muscle activation patterns and dynamic knee valgus at peak ground reaction force during drop jump landings: reliability, youth competitive alpine skiing-specific reference values and relation to knee overuse complaints. *Journal of science and medicine in sport*.
- Sahabuddin, F. N. A., Jamaludin, N. I., Amir, N. H., & Shaharudin, S. (2021). The effects of hip-and ankle-focused exercise intervention on dynamic knee valgus: a systematic review. *PeerJ*, 9, e11731.