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Title:

Modifying spike jump landing biomechanics in female adolescent volleyball athletes using video and verbal feedback

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Abstract

Recent evidence suggests that female athletes are 2-8 times more likely to experience injury to the anterior cruciate ligament (ACL) of the knee as compared to male athletes. Non-contact mechanisms, including landing from a jump, account for approximately 70% of all ACL injuries in sport. Specific attributes of jump landing, such as trunk and knee flexion angles at ground contact, are suggested to contribute to the injury mechanism. Both verbal and visual feedback have been shown to cause an immediate change in landing biomechanics in a laboratory setting. No data exist on the longer term effects of feedback on jump landing biomechanics in a sports specific setting. The purpose of this study was to determine whether providing video and verbal feedback to adolescent female volleyball athletes produced an improvement in landing technique. Lower extremity kinematic variables were measured in 19 participants using a 2-dimensional motion analysis system before a feedback session was provided to the intervention group (IG). Follow-up measurements were taken immediately, and at two and four weeks post-intervention in the IG. The control group (CG) was re-measured at the end of the four week study period. Using two-way repeated measures analysis of variance (ANOVA) to compare groups, the IG demonstrated increased trunk flexion compared to the CG at week four ($P \leq 0.025$). Within the IG, one-way ANOVA testing demonstrated that ankle dorsiflexion and right knee flexion changed significantly ($P \leq 0.025$). Paired t-tests showed right knee flexion and left knee valgus decreased within the CG over the four week study period ($P \leq 0.025$).

Augmented feedback appeared to have a positive effect on landing biomechanics in adolescent female volleyball athletes performing a specific sports skill. This may present a simple, cost effective method of introducing an ACL injury prevention program at a young age.