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

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Background

- Female participation in sport has increased dramatically in the last 30 years
- Female athletes are 2-8 times more likely to suffer an injury to the anterior cruciate ligament of the knee compared to males.
- Common mechanisms for ACL injury include sudden deceleration, pivoting on a planted foot, and landing from a jump.
- Compared to males, females land from a jump in a more upright position with less trunk, hip and knee flexion and an increased valgus knee position.

Purpose

- To improve the landing biomechanics of adolescent female volleyball players by providing video and verbal feedback.

Methods

- Nineteen adolescent female volleyball athletes were recruited for this study.
- Intervention group:
  - Filmed performing five volleyball spikes
  - Each athlete was provided with individualized verbal and video feedback regarding her landing biomechanics and then immediately filmed for a second time.
  - Successive filming sessions were carried out after two weeks and four weeks to assess whether any changes in landing biomechanics occurred, and whether that change was maintained over time.
- Control group:
  - Filmed at the beginning and the end of a four-week time period, with no feedback provided.

Results

- No significant differences were found between the control and intervention groups at the beginning of the study.
- Athletes in the intervention group landed with significantly more trunk flexion after four weeks compared to the control group.
- Athletes in the intervention group showed a tendency to land with increased hip and knee flexion after four weeks.
  - At both initial ground contact and the position of maximum flexion.
  - Flexion angles increased by up to 30°, but did not reach statistical significance.

Practical Implications & Future Direction

- Video & verbal feedback may be an effective, inexpensive method of improving jump landing biomechanics.
- This may help athletes avoid joint positions that could lead to injury, and specifically ACL injury.
- The role of the trunk in improving jump landing biomechanics requires further investigation, as does the longer term effect of providing feedback to female athletes.
- The effect of feedback on injury rates is also a topic for further study.

References