The effect of video feedback on landing technique in elite female team handball players, implications for ACL injury prevention

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Nothing to disclose
Prevention of Anterior Cruciate Ligament Injuries in Female Team Handball Players: A Prospective Intervention Study Over Three Seasons

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...applicable to team handball. The focus on the knee position (knee over toe) was supported by data from Ebstrup and Boysen-Moller and Olsen et al. Their video analyses of ACL injuries from team handball indicate that it could be beneficial not to allow the knee to sag medially or laterally during plant and cut movements or when suddenly changing speed. We also focused on two-feet landing after jump shot, with the emphasis on hip and knee flexion based on the Hewett et al. data from volleyball. We also tried to influence the player’s way of...
ACL injury prevention, more effective with a different way of motor learning?

Anne Benjaminse · Egbert Otten
Oke, stap naar de bal.
Motor Learning

Knowledge of performance

Knowledge of results

Enhances automaticity

IMPORTANT

Always keep the hips down.
Keep your weight on the ball of your foot.
Keep your upper body stable and facing forwards.
Keep your pelvis horizontal and do not let it tilt to the side.
Purpose

To evaluate whether video feedback, with an overlay method to stimulate EF, is an effective way to improve a handball-specific landing technique.
Materials & Methods

19 Elite Female Handball Players

<table>
<thead>
<tr>
<th></th>
<th>Video Group (n=8)</th>
<th>Control Group (n=8)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (yr)</strong></td>
<td>17.7 ± 0.9</td>
<td>17.5 ± 1.2</td>
</tr>
<tr>
<td><strong>Height (m)</strong></td>
<td>1.71 ± 0.03</td>
<td>1.73 ± 0.06</td>
</tr>
<tr>
<td><strong>Mass (kg)</strong></td>
<td>64.5 ± 6.8</td>
<td>69.6 ± 4.3</td>
</tr>
</tbody>
</table>
Materials & Methods

- **VIDEO GROUP**
  - PRE-TEST (5 trials)
  - TRAINING SESSION 1 (10 trials)
  - TRAINING SESSION 2 (10 trials)
  - POST-TEST (5 trials)

- **CONTROL GROUP**
  - PRE-TEST (5 trials)
  - TRAINING SESSION 1 (10 trials)
  - TRAINING SESSION 2 (10 trials)
  - POST-TEST (5 trials)

ASK FOR FEEDBACK
Materials & Methods

Test Set-up

Diagram showing test set-up with distances and positions marked.

Starting position is 1.75 m and 4.2 m from the camera.
Materials & Methods
Materials & Methods
Results
Range of Motion over time

![Graph showing range of motion over time for different body parts and time points.]

- Hip ROM CG
- Hip ROM VG
- Knee ROM CG
- Knee ROM VG
- Ankle ROM CG
- Ankle ROM VG

Key:
- Pre
- TR1
- TR2
- Post

Statistical significance: p<0.05
LESS score over time

Control group

Video group

Frontal-Plane Motion
1. Stance width
   - Normal (0)
   - Wide (1)
   - Narrow (1)

2. Maximum foot-rotation position
   - Normal (0)
   - Externally rotated (1)
   - Internally rotated (1)

3. Initial foot contact
   - Symmetric (0)
   - Not symmetric (1)

4. Maximum knee-valgus angle
   - None (0)
   - Small (1)
   - Large (2)

5. Amount of lateral trunk flexion
   - None (0)
   - Small to moderate (1)

Sagittal-Plane Motion
6. Initial landing of feet
   - Toe to heel (0)
   - Heel to toe (1)
   - Flat (1)

7. Amount of knee-flexion displacement
   - Large (0)
   - Average (1)
   - Small (2)

8. Amount of trunk-flexion displacement
   - Large (0)
   - Average (1)
   - Small (2)

9. Total joint displacement in the sagittal plane
   - Soft (0)
   - Stiff (2)

10. Overall impression
    - Excellent (0)
    - Average (1)
    - Poor (2)
Performance measures

Shot accuracy
Vertical jump height
Discussion

Kinematic data frontal plane

Less score

Retention/transfer
Take Home Message
Visual feedback
VIDEO FEEDBACK:
EXPERT MODELING
IOC WORLD CONFERENCE ON PREVENTION OF INJURY & ILLNESS IN SPORT

33 symposia

5 keynote lectures

122 speakers

workshops

abstracts

Deadline: September 1, 2016

MONACO
16-18 MARCH 2017

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www.ioc-preventionconference.org
Session A – Symposium 6
The brain’s role in ACL injury prevention

Chair: Eva Ageberg (Sweden)

Programme:
Eva Ageberg (Sweden): Introduction (7 minutes)

Charles Buz Swanik (USA): The brain’s role in ACL injury prevention (12 minutes)

Anne Benjaminse (Netherlands): Motor learning in ACL injury prevention (12 minutes)

Jochen Baumeister (Germany): Neuroplasticity – from theory to practice in ACL injury prevention (12 minutes)

Ageberg, Swanik, Benjaminse, Baumeister: Panel discussion – How can we optimize ACL injury prevention considering motor learning? (17 minutes)
The requirements were as follows:
1) knee varus/valgus moment < 22.25 Nm/kg
2) knee flexion range > 45°
3) peak vGRF ≤ 17.90 N/kg