2D Video Feedback Improves Landing Technique in Elite Female Handball Players

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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 Ebsstrup and Boysen-Moller\(^{19}\) and Olsen et al.\(^{20}\) 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.\(^{17}\) data from volleyball. We also tried to influence the player’s way of...
Motor Learning
Implicit motor learning leads to better retention with physical or psychological stress.

Explicit motor learning involves no or little knowledge about the execution of movement (subconscious).

Motor learning stimulates automatic learning processes.
Purpose

To evaluate whether overlay video feedback 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>
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<tbody>
<tr>
<td><strong>AGE (yr)</strong></td>
<td>17.7 ± 0.9</td>
<td>17.5 ± 1.2</td>
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<tr>
<td><strong>HEIGHT (m)</strong></td>
<td>1.71 ± 0.03</td>
<td>1.73 ± 0.06</td>
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<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

CONTROL GROUP

PRE-TEST (5 TRIALS)

TRAINING SESSION 1 (10 TRIALS)

ASK FOR FEEDBACK

ASK FOR FEEDBACK

TRAINING SESSION 2 (10 TRIALS)

POST-TEST (5 TRIALS)

ask for feedback
MATERIALS & METHODS
Materials & Methods
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Results

Range of Motion over time
LESS score

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

Graph showing LESS score changes over time for Control and Video groups.
Performance measures
Discussion

Kinematic data frontal plane

LESS score

Retention/transfer
Take Home Message

Visual feedback
VIDEO FEEDBACK: MODELING