Knee control and jump-landing technique in young basketball and floorball players

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Background
Poor knee alignment is associated with increased loading of the joints, ligaments and tendons, and may increase the risk of injury. The study purpose was to compare differences in knee kinematics between basketball and floorball players during a vertical drop jump (VDJ) task.

Methods
Players (aged 12–21 years) were recruited from six basketball and floorball clubs of the Tampere City district, Finland. Complete data was obtained from 173 basketball and 141 floorball players. Peak knee valgus and flexion angles during the VDJ were analyzed by 3D motion analysis.

Results
Larger knee valgus angles were observed among basketball players compared with floorball players (mean valgus -3.2° and -0.9°, respectively). Basketball players landed with a decreased peak knee flexion angle compared with floorball players (mean flexion 83.1° and 86.5°, respectively). There were no significant differences in height, weight or BMI between basketball and floorball players. The female athletes exhibited significantly larger peak knee valgus angles than the male athletes (mean valgus -7.5° and 3.4°, respectively) (Table 1).

Conclusions
This study revealed that proper knee control during jump-landing does not seem to develop in young athletes simply by playing the sport, despite the fact that jump-landings occur frequently in practice and games. Poor knee control was especially common among young female athletes. An important clinical implication of these findings is that young team sport athletes need to be taught a safer technique for landing and also need specific neuromuscular training in order to avoid potentially harmful movement patterns. (Int J Sports Med 2016;37:334–338)

Table 1. Peak knee varus/valgus and flexion angles (age adjusted) according to gender and sport.

<table>
<thead>
<tr>
<th></th>
<th>Male (n=153)</th>
<th>Female (n=161)</th>
<th>p-value</th>
<th>Basketball (n=173)</th>
<th>Floorball (n=141)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak knee varus/valgus* angle</td>
<td>3.4 (2.1–4.6)</td>
<td>-7.5 (-8.7– -6.2)</td>
<td>&lt;0.001**</td>
<td>-3.2 (-4.5– -2.0)</td>
<td>-0.9 (-2.3–0.6)</td>
<td>0.022**</td>
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<tr>
<td>Peak knee flexion angle</td>
<td>84.5 (82.8–86.2)</td>
<td>85.1 (83.5–86.8)</td>
<td>0.607</td>
<td>83.1 (81.4–84.8)</td>
<td>86.5 (84.6–88.4)</td>
<td>0.016**</td>
</tr>
</tbody>
</table>

Mean (95% CI); *Negative values referring to valgus and positive to varus movement; **P-value <0.05 regarded as significant.