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Dynamic knee valgus in preschool children – a cross-sectional study on 458 children using markerless motion capturing technology

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• Dynamic knee valgus (DKV) is a risk factor for some lower extremity injuries and pain syndromes in adults and adolescents¹-⁵, but little is known about DKV during childhood development⁶.
• We examined DKV at impact during jump landings in a group of 458 preschool children.
• Girls were twice as common as boys among those children with most pronounced levels of DKV.

References
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Background

- Dynamic Knee Valgus (DKV) (Fig. 1)
- Risk factor
- Sex differences
- Childhood?

Aims

To investigate DKV measured as KASR (Fig. 2) in a sample of 458 preschool children

- The extent of DKV in the sample
- Age and sex differences in DKV
- The relationship between DKV and motor-performance
Methods and participants

Fig. 3. Participants (n=458)

Fig. 4. Markerless motion capture

Fig. 5. Kinematic groups were based on KASR measured at impact

Statistics
- Chi-squared tests
- Multiple linear regression
Results

- 75% of the children displayed some level of DKV (Fig. 5)
- Twice as many girls in the Valgus group (p = .01) (Fig. 6)
- No statistically significant age differences (p = .19) (Fig. 7)
- Only minor differences in motor performance (not shown)

Fig. 6. Kinematic group and sex

<table>
<thead>
<tr>
<th>Groups</th>
<th>Boys (n = 219)</th>
<th>Girls (n = 239)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valgus</td>
<td>30.8%</td>
<td>69.2%</td>
</tr>
<tr>
<td>Neutral</td>
<td>48.7%</td>
<td>51.3%</td>
</tr>
<tr>
<td>Varus</td>
<td>57.9%</td>
<td>42.1%</td>
</tr>
</tbody>
</table>

Fig. 7. Kinematic group and age

Conclusion

- Some level of DKV measured at impact in jump landings is common.
- Girls are more prevalent among those children with the most extreme values of DKV.