

## Summary

The current thesis aimed at achieving more knowledge of knee injuries and intrinsic and extrinsic risk factors for these injuries in a cohort of school children aged 8-15 years, with special emphasis on children with GJH.

This thesis was based upon four studies, with data obtained from The Childhood Health, Activity and Motor Performance School Study – Denmark. The number of participants in the studies varied from 39 to 1327 children, depending on the study design and purposes.

1. Study I evaluated the inter-tester reproducibility and inter-method agreement of BT for hypermobility
2. Study II reported the distribution and incidence of traumatic and overuse knee injuries and potential risk factors for these injuries, focusing at the intrinsic factors of sex, age, height, BMI, GJH, previous knee injuries, and the extrinsic factors of amount of organised sport participation and sports type
3. Study III assessed the extent of knee injuries in children with GJH and knee hypermobility and the risk of knee injuries for the GJH group
4. Study IV investigated potential differences in knee joint neuromuscular control in children with GJH compared with controls before and after landing in the Single Leg Hop for distance test

In study I, the variant of BT for hypermobility applied in this thesis had a moderate-substantial inter-tester reproducibility. No difference was found for the prevalence of GJH in the inter-method comparison study of this variant and a slightly different variant of the BT.

The main findings of study II were that growth-related overuse knee injuries was the main injury type. For traumatic knee injuries, tumbling gymnastics was an extrinsic risk factor and GJH was a borderline significant intrinsic risk factors. Intrinsic risk factors for overuse knee injuries were being a girl, previous knee injury and extrinsic factors were children participating in soccer, handball, basketball, rhythmic and tumbling gymnastic. Further extrinsic risk factors for both types of injury were participation in sports above two times/week.

In study III, similar frequent knee injury types were found in GJH and controls. No significant increased risk was found for knee injuries for the GJH group, but a large variation between the individuals child's status of GJH was observed and included in the analyses between test rounds.

In the last study IV, children with GJH had a different knee neuromuscular strategy than controls before and after landing from the SLHD test, although no difference in jump length was found between groups. Generally, ST was activated less in children with GJH than in controls, both before and after landing from the SLHD test. At the same time, an increased activation of GM and a larger CCI of the lateral knee muscle group (VL-GL) was seen for the GJH group before landing, while no increased GM activity was seen after landing. Reduced pre and post-activation of the ST may present a risk factor for future traumatic knee injuries in participants with GJH and knee hypermobility.