
The Effects of Pediatric Obesity on Patellofemoral Joint Contact Force during Walking

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Setting the scene:

Obesity increases a child's risk of developing knee pain across the lifespan, potentially through elevated patella-femoral joint loads that occur during habitual weight-bearing activities. Do obese children have greater absolute and patellar-area-normalized patella-femoral joint forces compared to healthy weight children during walking?

What did they do?

Twenty individuals between the ages of 8 and 12 participated in this study. Ten participants were obese with a BMI z-score greater than the 95th percentile and 10 participants were of healthy-weight. Subjects walked on an instrumented treadmill at a constant rate (1.0 m/s) that was close to the preferred speeds reported in children. Participants walked for 5 minutes prior to data collection allowing time to acclimate to treadmill locomotion. Reflective markers were placed on the 7th cervical vertebrae, acromion processes, right scapular inferior angle, sterno-clavicular notch, xyphoid process, 10th thoracic vertebrae, posterior-superior iliac spines, medial and lateral epicondyles of femurs, medial and lateral malleolus, calcanei, first metatarsal heads, second metatarsal heads, and proximal and distal heads of the 5th metatarsals

Takeaway message:

It was found that obese children have greater patella-femoral joint contact forces compared to healthy-weight children during walking. Elevated patella-femoral joint contact forces relative to the area of the articulating surface may have long-term negative consequences for the patella-femoral joint because elevated mechanical loads have been associated with cartilage degeneration and patella-femoral pain. These findings may help clinicians develop exercise or rehabilitation programs specifically for obese children to reduce the risk of patella-femoral injury.