

Sophie Holland

Supervisor: Dr. Lauren Lattimer

Research Focus

This research investigated the effect of a hip muscle fatigue protocol on females performance of dynamic jump landings and unanticipated cutting tasks. The fatigue protocol specifically targeted the abductors and external rotators at the hip, as they function to stabilize the hip and lower extremities during athletic movements. Since neuromuscular control provides joint stability, when it becomes compromised it can lead to altered positioning during dynamic tasks and increase the risk of injury. This study was conducted in the John MacIntyre motion Laboratory of Applied Biomechanics, using the 3D motion capture system and retroreflective markers to collect and observe movement data. The participants in this study completed the dynamic jump landing and unanticipated cutting tasks pre- and post-fatigue, focusing on the impact of hip muscle fatigue on their dominant leg only. The results of this research highlighted that females compensate for hip stabilizer fatigue by altering their hip joint positioning, demonstrating positions often associated with lower extremity injuries. These positions included a more upright posture and a collapsing at the hip into adduction during the dynamic jump landing and unanticipated 90° cutting tasks, respectively. The significant findings of this study emphasize the importance of targeting the hip musculature when designing injury prevention and intervention programs to increase strength and endurance. Additionally, incorporating fatigue into training programs may be beneficial in identifying athletes with high risk biomechanics when completing dynamic tasks in a fatigued state.

The Researcher



Sophie Holland is from Tantallon, Nova Scotia and she is working under the supervision of Dr. Lauren Lattimer to complete her honours thesis. Sophie hopes to attend physiotherapy school and pursue a career in that field following graduation.