

## **Abstract**

This research project aims to investigate muscle coordination patterns during heel raises in dancers, specifically coordination between deep compartment lower leg musculature including the flexor hallucis longus (FHL) and the larger superficial plantarflexors. Heel raises are a common evaluation technique, and modifications could create potential treatment tools for FHL tendinopathy, an overuse injury so prevalent in dancers that it is frequently called “dancer’s tendinitis”. Despite the high prevalence, especially in female ballet dancers, there has been little research on non-surgical prevention or treatment. The proposed design is cross-sectional; with three groups – healthy non-dancers, healthy dancers, and dancers with posterior ankle pain. Participants will undergo a series of clinical measures in order to evaluate involvement of the FHL tendon in posterior ankle pain. Then, researchers will compare lower leg muscle activation patterns between these groups during a repetitive heel raise, a maneuver reported to contribute to the high incidence of FHL tendinopathy in dancers. In addition, a modification of this evaluation technique where the participants’ toes are off the edge of a supporting block will be investigated within-participants and between-groups. This study will elucidate muscular coordination strategies used by dancers to conduct a heel raise – a task used to examine lower limb function, completed dozens of times in dance class or performance, and frequently reported to place high demands on the FHL and toe flexors – and will provide the first evidence of muscle coordination patterns during a “toes off” lower leg exercise. Findings will support the further study of this task longitudinally as an evaluation tool and as an intervention for the prevention and non-surgical treatment of FHL tendinopathy.