**Title:** Peak Limb Loading is Related to Patient-reported Function Following Gait Retraining Among Individuals with Anterior Cruciate Ligament Reconstruction

**Word Count:** 250/250

**Background:** Previous research suggests a positive relationship between peak limb loading during gait and patient-reported knee function following anterior cruciate ligament reconstruction (ACLR). Therefore, intervening on peak limb loading during gait retraining may enhance patient-reported knee function.

**Purpose:** The purpose of this study was to investigate the relationship between peak limb loading and patient-reported knee function following 6-weeks of gait retraining. We hypothesized that participants with greater peak limb loading would report better knee function.

**Methods:** Following 6 weeks of gait retraining, participants returned to walk on a split-belt force-sensing treadmill for 5 minutes. Peak limb loading was characterized as peak vertical ground reaction force (vGRF) during the first half of stance. Participants completed the International Knee Documentation Committee (IKDC) survey to characterize knee function.

**Statistical Analysis:** We computed descriptive statistics for participant demographics and outcomes of interest. We utilized Pearson’s correlations (r) to determine the association between peak limb loading (i.e., peak vGRF) and patient-reported function (i.e., IKDC score). Correlations were characterized as: perfect (r=1), strong (1>r≥0.8), moderate (0.8>r≥0.4), and weak (0.4>r>0). Alpha was set *a priori* to 0.05.

**Results:** Nine participants (6Female; 24.1(10.5) months post-ACLR) were included in this analysis. Following 6-weeks of gait retraining, peak vGRF was strongly and positively associated with IKDC score (r= 0.850; 95%CI: 0.427, 0.968).

**Discussion**: Our results support our hypothesis that participants with greater limb loading (i.e., greater peak vGRF) report better knee function (i.e., greater IKDC scores). This suggests that intervening on peak limb loading may provide an avenue for enhancing patient-reported knee function among this population.