

Greater than half of pregnant females report hip, knee, or foot pain and another half report pelvic or low back pain. Females continue to experience increased prevalence of lower extremity and lumbar and pelvic pain after giving birth compared to non-pregnant females. This pain has potential long term significance with respect to joint pathology and quality of life. Despite the high rates of musculoskeletal pain during and after pregnancy, few studies have examined lower extremity and trunk dynamics in this population. No study, to date, has comprehensively evaluated joint loading and muscle activation during gait in pregnant, post-partum, and nulliparous females. Better understanding lower extremity joint loading (joint moments, power, and energy) and trunk and lower extremity muscle activation may elucidate neuromuscular adaptations which occur during pregnancy and persist post-partum. Because pregnant participants often report pain with walking and because gait is a critical aspect of everyday life, it is important to understand how pregnant females adapt their gait in response to the changes occurring during pregnancy. It is also important to evaluate across the joints of the lower extremity to better understand how loads are distributed across the kinetic chain. Therefore, the primary purpose of this research is to determine adaptations in lower extremity biomechanics and trunk and lower extremity muscle activation during gait in pregnant, post-partum, and nulliparous females. **There is a need for the development of better interventions to alleviate musculoskeletal pain in this population. Understanding trunk and lower extremity neuromuscular adaptations during and after pregnancy is a crucial first step toward the development of physical therapy interventions and injury prevention strategies.** The long term goal of this research is to promote lifelong joint health in females.