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Comparisons of Muscular Activity inMales and Females While Walking in Restricted Postures

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Abstract

The purpose of this study was to examine differences in muscular activation between males and females while walking in restricted postures. Restricted postures are evident in various industries, including mining, construction and agriculture. These postures are associated with musculoskeletal disorders and lower back pain. Studies generally focus on a male workforce; however, more females are entering industrial workplaces. Twelve male and 12 female subjects between the ages of 18 and 25 years participated in the study. Subjects walked on a treadmill at a speed of 3.5 km/h for four minutes under conditions of upright walking, and stooped walking under restrictions at 85% and 70% of stature. Electromyographic activity was measured on seven muscles (trapezius, latissimus dorsi, erector spinae, rectus femoris, biceps femoris, medial gastrocnemius and tibialus anterior). Ratings of Perceived Exertion (RPE) and Body Discomfort were also obtained. The extent of vertical restriction significantly altered levels of muscle activation. Female subjects had significantly lower levels of activation of the medial gastrocnemius than males. Local RPE was greatest under the lowest restriction, and body discomfort of the neck, lower back and hamstrings was evident during restricted walking. Work design and interventions should consider these consequences.