

Fatigue in Isometric Exercise

KIMBERLY FOS, HALEY LIGHTSEY, & CHLOE RANDALL

Movement Laboratory; Department of Kinesiology; Stephen F. Austin State University;
Nacogdoches, TX

Category: Undergraduate

Advisor / Mentor: Chelette, Amber (chelettea@sfasu.edu)

ABSTRACT

The quadricep muscles are important for maintaining balance. As these muscles fatigue, it becomes more difficult to maintain the proper body position resulting in shifts in center of pressure. The wall sit exercise places substantial load on the quadricep muscles, which are important for maintaining balance.

PURPOSE: The purpose of this study was to examine how fatigue affects the of center of pressure during a 45 second wall sit exercise. It was hypothesized that fatigue would increase over time, causing the center of pressure to shift. **METHODS:** Nine healthy adults, ages 18-25, and all right foot dominant, performed a 45 second wall sit while standing on a Kinvent® Force Plate. The wall sit required the subjects to stand with their back against a wall, feet shoulder-width apart, and lower their body until their thighs were parallel to the ground. Center of pressure data was collected during the first 10 seconds and last 10 seconds of the exercise using a Kinvent ® Force Plate. **RESULTS:** The average center of pressure for the first 10 seconds was 47.95% on the left foot and 52.04% on the right foot cumulatively. For the last 10 seconds, the values were 49.74% on the left foot and 50.25% right foot. **CONCLUSION:** In conclusion, this study found that center of pressure shifts during a 45 second wall sit exercise, providing evidence that fatigue negatively impacts balance control during submaximal isometric muscle contractions. Further research is needed to determine the mechanisms behind this effect and how it may impact injury risk. Implementing balance training alongside strengthening exercises could help improve motor control and joint stability when muscles are fatigued.