

HOW BACKPACKING LOADS EFFECT GAIT: AN OBSERVATIONAL STUDY

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An observational study design was utilized for this study, and the study was approved by The College of St. Scholastica's Institutional Review Board.

Background: Backpacking injuries are common and are often related to increased loads and increased duration of carrying loads. Therefore, the purpose of this observational study was to comprehensively evaluate the effects of increased backpacking loads on gait in adults by examining spatial-temporal, kinematic, and electromyographic outcomes.

Methods: An observational basic study design was utilized using a convenience sample of four subjects (three males, one female, average age 23.5 years). Data set-up and collection occurred by a physical therapy student using an eight-camera motion capture system, two force platforms, a 35 foot walkway, and surface electromyography. Subjects walked back and forth until five trials were collected with no load, ten percent of body weight and thirty percent of body weight load conditions.

Results: The greatest changes were seen in the thirty percent body weight condition. Trunk flexion relative to the lab had the greatest percent mean difference, followed by pelvic tilt, pelvic rotation, trunk flexion relative to the lab, and gluteus maximus peak activity.

Discussion: The findings show biomechanical adaptations that occur during gait when carrying progressive backpack loads. If backpacks are worn for long periods of time, the biomechanical adaptations may cause musculoskeletal impairments.

Conclusion: Backpack loads of thirty percent of body weight are not recommended, and ten percent of body weight are acceptable. More research is needed to find an appropriate body weight percentage cut-off point between ten and twenty nine percent.