Abstract

Background: Partial body weight support (BWS) systems have been broadly used with treadmills as a strategy for gait training of individuals with gait impairments. Considering that we usually walk on level ground and that BWS is achieved by altering the load on the plantar surface of the foot, it would be important to investigate some ground reaction force (GRF) parameters in healthy individuals walking on level ground with BWS to better implement rehabilitation protocols for individuals with gait impairments.

Objective: To describe the effects of body weight unloading on GRF parameters as healthy young adults walked with BWS on level ground.

Method: Eighteen healthy young adults (27±4 years old) walked on a walkway, with two force plates embedded in the middle of it, wearing a harness connected to a BWS system, with 0%, 15%, and 30% BWS. Vertical and horizontal peaks and vertical valley of GRF, weight acceptance and push-off rates, and impulse were calculated and compared across the three experimental conditions.

Results: Overall, participants walked more slowly with the BWS system on level ground compared to their normal walking speed. As body weight unloading increased, the magnitude of the GRF forces decreased. Conversely, weight acceptance rate was similar among conditions.

Conclusions: Different amounts of body weight unloading promoted different outputs of GRF parameters, even with the same mean walk speed. The only parameter that was similar among the three experimental conditions was the weight acceptance rate.

Keywords

Gait; rehabilitation; partial body weight support; kinetics.