THESIS: Load Distribution and Postural Changes in Young Adults When Wearing a Traditional Backpack Versus the BackTpack

STUDENT: Kimberly Dahl

DEGREE: Master of Science

COLLEGE: Applied Sciences and Technology

DATE: July 2015

PAGES: 71

Over 40 million students in the U.S. use backpacks regularly. Backpacks lead to poor posture due to the posterior placement of the load, which overtime may contribute to low back pain and musculoskeletal complications. This study examined postural and load distribution differences between a traditional backpack (BP) and a nontraditional backpack (BTP) in a young adult population. Using a 3D motion analysis system, 24 healthy young adults (22.5±2.5 years, 12 male) completed both static stance and walking trials on a treadmill with no load and with 15% and 25% of their body weight using the two different backpacks. There was a significant difference in trunk angle, head angle, and lower extremity joint mechanics between the backpack and load conditions during walking (p<.05). There was also a significant difference in head angle from pre- to post-walk (p<.05). Taken together, the results indicate that the BTP more closely resembled the participants’ natural stance and gait patterns as determined by the No Load condition. The more upright posture supported by the BTP may help reduce characteristics of poor posture and ideally help to reduce low back pain while carrying loads.