

Simulation of symmetrical lifting to determine proper load distribution on the body joints using 3DSSPP software

Harrison Kloke, Mohammad Abdoli-Eramaki

School of Occupational and Public Health, Ryerson University, Toronto, Canada

Training for safe lifting techniques is used by employers to lower their exposure to risk of workplace injuries. In our previous studies (Abdoli et al., 2017), 266 attendees at two professional conferences were asked to identify and demonstrate their preferred lift technique with the demonstration being an *ideal* floor-to-waist height lift of a 10-kg weighted crate. The results showed that the trained group experienced less loading at L5/S1, but higher loading at the knees and ankles. In order to model the best lifting conditions, 19 postures have been modelled in 3D Static Strength Posture Prediction software [3DSSPP] across different population percentiles and genders. Postures were modelled on the techniques that workers may use to lift a 10-kg object from the ground. While certain postures may reduce the load placed on one joint, the load is often shifted to a different joint. Therefore, when selecting an optimal lifting posture many factors must be evaluated and considered. Evaluation of postures was based on joint moments, spinal forces, balance, and a population's capability to produce that posture.