

The Effects of Seat Heights and Obesity on Lower-Limb Joint Kinematics during Sit-To-Stand Movement

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Abstract : The main purpose of this study was to compare obese people to the non-obese in terms of joint kinematics in lower-limb body. The height of chairs was also considered as a design factor. Obese people had a difficulty in sit-to-stand (STS) tasks compared to the non-obese people. High chair heights can make STS task easy and it helps the obese to be more comfortable with STS task in particular. Subjects were instructed to wear inertial measurement unit (IMU) sensors. They perform STS task using chairs of different heights. Joint kinematics and subjective ratings of discomfort were measured. Knee angles of the obese group were greater than that of the non-obese group in normal type. No significant difference in joint kinematics was found in high chair. Interaction effect was found between obesity and height of chair. The results verified the previous research that had suggested a biomechanical model of STS movement. The results can be applied to occupational design for the obese.

Keywords : biomechanics, electromyography, joint kinematics, obesity, sitting, sit-to-stand

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