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Effects of dynamic office chairs on trunk kinematics, trunk extensor EMG and spinal shrinkage.

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Abstract

Seated work has been shown to constitute a risk factor for low-back pain. This is attributed to the prolonged and monotonous low-level mechanical load imposed by a seated posture. To evaluate the potential health effects with respect to the low back of office chairs with a movable seat and back rest, trunk kinematics, erector spinae EMG, spinal shrinkage and local discomfort were assessed in 10 subjects performing simulated office work. On three separate occasions subjects performed a 3 h task consisting of word processing, computer-aided design and reading. Three chairs were used, one with a fixed seat and back rest and two dynamic chairs, one with a seat and back rest movable in a fixed ratio with respect to each other, and one with a freely movable seat and back rest. Spinal shrinkage measurements showed a larger stature gain when working on the two dynamic chairs as compared with working on the chair with fixed seat and back rest. Trunk kinematics and erector spinae EMG were strongly affected by the task performed but not by the chair type. The results imply that dynamic office chairs offer a potential advantage over fixed chairs, but the effects of the task on the indicators of trunk load investigated were more pronounced than the effects of the chair.

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