Interrater reliability of directly-observed stepping and reclining in lower limb amputees in a laboratory setting

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Introduction: Accurate measurement of physical behaviours in adults with lower limb absence is essential to report true patterns of physical behaviour and the effectiveness of interventions. Observation methods are often used for criterion-related validation. Establishing interrater reliability within direct observation methods is an important and necessary precursor to criterion-related validity studies.

Purpose: To assess the interrater reliability for quantifying steps and reclining time in simulated lifestyle activities in adults with unilateral lower limb absence.

Methods: 15 adults completed three trials of a simulated set of lifestyle activities including kitchen work, sitting and lying and purposeful walking. Trials were video recorded and subsequently analysed independently by three trained raters for three types of behavioural event (incidental stepping, purposeful stepping and reclining). Data were analysed using oneway intraclass correlation coefficients (ICC) and oneway repeated measures ANOVA and effect sizes (Cohen's d).

Results: Reliability was high for the reliability of three raters (ICCs ranged from .98-1.00 for the three types of physical behaviours), and also when adjusted for a single rater (ICCs ranged from .93-.99). Although there were significant ($p < .05$) mean differences among raters for incidental steps, total steps, and reclining time, these corresponded to small effect sizes ($d = 0.08$-0.29).

Conclusions: Trained raters are able to consistently judge brief, incidental stepping and more prolonged stepping events as well as sitting and lying events performed by adults with unilateral lower limb absence in controlled laboratory simulations. Multiple raters are not needed in order to obtain reliable data. These data can be used to obtain a reliable record of physical behaviours for criterion-related validation of other measures such as accelerometers.

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