Evidence on the reliability of back mobility measures remains scarce in children. This prevents the establishment of appropriate protocols for screening pediatric population for spinal mobility problems. The aim of this study was to examine the reliability of a spinal extension and flexion assessment protocol using a skin-surface device. Spinal curvature was measured during standing, full flexion, and full extension in fifty-three healthy children (10.2 ± 1.4 years) by three examiners on two separate occasions. Intraclass correlation coefficients (ICC), and standard errors of measurement (SEM) were used to examine between-day and inter-examiner reliability for thoracic, lumbar and hip range of motion as well for motion of segments from T1-2 to L5-S1. For global mobility measures, the between-day ICCs ranged from 0.62 to 0.94 and the inter-examiner ICCs ranged from 0.42 to 0.89. Reliability was higher for standing curvature measures compared with flexion and extension range of motion. The ICCs were lower for segmental ranges of motion, ranging from 0.22 to 0.94. The average between-day SEM over all vertebral levels was approximately 1-2°. The present results indicated high reliability of global spinal mobility measures in children. The reliability of segmental ranges of motion, especially in extension and flexion of the spine ranges from moderate to low. The present protocol is adequate for an easy and non-invasive initial screening of spinal curvature and movement in children.

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