The Validity and Reliability of the Angulus Smartphone Application for Measuring Scoliosis Curvature

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Abstract:

Accurate measurement of spinal curvature is essential for diagnosing and monitoring scoliosis. While the Cobb's angle remains the gold standard, it involves radiation exposure and requires specialized training. The Angulus app provides a non-invasive alternative for measuring spinal curvature. This study evaluated its validity and reliability compared to radiographic Cobb's angle measurements in 50 scoliosis patients. Senior Assistant Professor (Orthopedician) (Assessor 1) performed Cobb's angle measurements. Another Senior Resident (Orthopedics) (Assessor 2) and Intern (Prosthetics and Orthotics Department) (Assessor 3) used the Angulus app. Validity was assessed using the Pearson correlation coefficient, and reliability was determined using the intraclass correlation coefficient (ICC). Results showed a strong correlation between Angulus and Cobb's angle measurements (0.56–0.89). Intra-rater reliability was excellent for Assessor 1 (ICC: 0.78–0.92) and good to excellent for Assessor 2 (ICC: 0.73–0.90). Inter-rater reliability was also excellent (ICC: 0.88–0.95). These findings support Angulus as a valid and reliable, radiation-free tool for scoliosis assessment, enabling convenient digital tracking of spinal curvature.

Keywords:

Cobb's angle, scoliosis, smartphone application, spinal curvature, reliability, validity.