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The Tweezers as a final solution for the assessment of Angle Trunk Rotation - Reliability study compared with the Gold Standard Tool

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Introduction: The measurement of the Angle Trunk Rotation (ATR) is one of the essential assessments for the treatment of scoliosis patients and an adolescent group screening. The ATR is classically measured using a specific tool called scoliometer. In recent years many digital smartphone applications that replicate the scoliometer's measurement are available. Many scientific papers compared both tools showed excellent reliability. Some plastic supports have been developed to guaranty the stability of the smartphone but the shape of these tools is not always adequate to the size of all smartphones.

Objectives: To assess the correlation of a new, simple and very cheap tool applicable directly to any smartphone compared with the classic scoliometer. To assess the inter-rater reliability of ATR measurements, performed with both tools.

Method: Two simple tweezers have been applied to the lateral aspect of the smartphone. They allow creating symmetrical support that avoids contact between the smartphone and the spinous apophyses. No patients were involved in the study because enough scientific papers have already been published, verifying the reliability of the scoliometer and the digital applications of smartphones. The subjects involved were fellow physiotherapists who participated in a training course. 25 blind measurements were performed by two physiotherapists. Statistical analysis was performed by a third operator, using Pearson's Correlation Index and Bland-Altman plot.

Results and Discussion: The results showed excellent consistency of measurements using both tools. The Pearson Correlation Index between a standard scoliometer and the adapted scoliometer was 0,805504. The intra-operator reliability was 0,86532. Using tweezers to adapt a smartphone and making it suitable to measure the ATR of a scoliotic trunk is a procedure having two specific advantages: The tweezers are very cheap and can be applied to any type of smartphone.

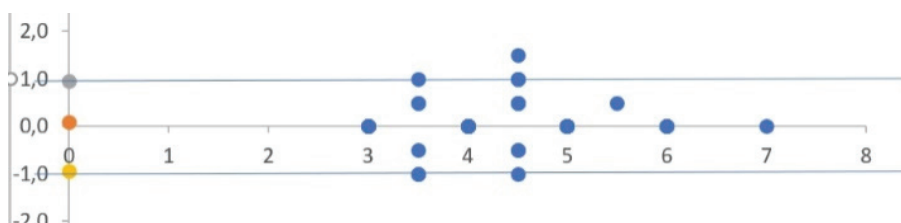


Figure 1 Bland and Altman plot showing an excellent intra-rater reliability using scoliometer and adapted phone

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