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LETTER

Psychometric Properties of a Smartphone Application for Measuring Shoulder Active Range of Motion in Individuals with and Without Shoulder Pain and Mobility Deficits [Letter]

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Dear editor

We read with interest the study by Aafreen et al titled "Psychometric Properties of a Smartphone Application for Measuring Shoulder Active Range of Motion in Individuals with and without Shoulder Pain and Mobility Deficits". The study addresses an important and clinically relevant question, particularly in the context of the increasing integration of smartphone-based technologies into musculoskeletal assessment and rehabilitation practice. By exploring both reliability and validity across symptomatic and asymptomatic populations, the authors attempt to provide a comprehensive evaluation of the application's measurement properties. Such efforts are valuable in advancing accessible, cost-effective, and technology-driven assessment tools in physiotherapy.[1] However, several aspects require clarification to strengthen the study's methodological rigour and clinical applicability.

First, although intraclass correlation coefficients (ICCs) were used to assess reliability, the specific ICC model, eg., ICC*(2,1) vs ICC(3,k), was not reported. This is a critical limitation, as different ICC models are based on varying assumptions and may lead to different interpretations of reliability. According to Koo and Li's guidelines,[2] clear reporting of the ICC model is essential to ensure transparency, reproducibility, and accurate interpretation of findings.[2]

Second, the use of Pearson's correlation coefficient to assess criterion validity may not be appropriate in this context. Correlation measures the strength of association rather than agreement between two measurement methods and may therefore overestimate validity. Agreement-based approaches, such as ICC or Bland–Altman analysis are considered more suitable for evaluating measurement tools.[3]

Third, the intra-rater reliability was assessed within a short time interval (within hours), which may not adequately reflect true test–retest reliability. Short intervals can artificially inflate reliability estimates, as testing conditions and participant performance remain relatively unchanged. Longer intervals are recommended to better represent clinical conditions.[4]

Fourth, significant differences in baseline characteristics, particularly age and body mass index, were observed between groups. These variables are known to influence shoulder range of motion and measurement consistency, and the absence of statistical adjustment for these confounders may affect the internal validity of the findings.[5]

Fifth, the use of convenience sampling may introduce selection bias and limit the generalizability of the findings. A more representative sampling strategy would enhance the external validity and applicability of the results to broader clinical populations.[6]

Finally, the restriction of the study population to individuals aged 20–50 years may further limit the generalizability of the findings. Considering that shoulder disorders are highly prevalent in older adults, the exclusion of individuals

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above 50 years reduces the clinical applicability of the results. Moreover, age-related differences in joint mobility and movement patterns may influence measurement reliability, potentially leading to an overestimation of the reported outcomes.[5]

We urge the authors to consider these points, as addressing these concerns would strengthen the methodological quality and enhance the clinical relevance of the study.

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Disclosure

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