Validation of Self-Report Pain Scales in Children

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ABSTRACT

Introduction: The Faces Pain Scale–Revised (FPS-R) and Color Analog Scale (CAS) are self-report pain scales commonly used in children but insufficiently validated. Our objectives were to determine the psychometric properties (convergent validity, discriminative validity, responsivity and reliability) of the FPS-R and CAS, and to determine whether degree of validity varied based on age, sex, and ethnicity.

Methods: We conducted a prospective, observational study of English and Spanish-speaking children ages 4–17 years. Children with painful conditions indicated their pain severity on the FPS-R and CAS pre- and 30 minutes post-analgesia. We assessed convergent validity (Pearson correlations, Bland-Altman method); discriminative validity (comparing pain scores pre- and post-analgesia); responsivity (comparing pain scores in children with pain against those without pain); and reliability (Pearson correlations, repeatability coefficient).

Results: Of 620 patients enrolled, mean age was 9.2±3.8 years; 291(46.8%) children were female; 341(55%) Hispanic; and 313(50.5%) younger age group (<8 years old). Pearson correlation was 0.85, with higher correlation in older children and females. Lower convergent validity was noted in children less than 7 years of age. All subgroups based on age, sex, and ethnicity demonstrated discriminative validity and responsivity for both scales. Reliability was acceptable for both the FPS-R and CAS, with Pearson correlations of 0.77 and 0.89, and repeatability coefficients of ±0.53 and ±0.35, respectively.

Conclusions: The FPS-R and CAS overall demonstrate strong psychometric properties in children ages 4 to 17 years, and between subgroups based on age, sex, and ethnicity. Convergent validity was questionable in children less than 7 years old.