O71
Cross-cultural adaptation and psychometric properties of the traditional Chinese version of the Italian spine youth quality of life (ISYQOL) questionnaire

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Introduction: Adolescent idiopathic scoliosis (AIS) may adversely affect the health-related quality of life (HRQOL) of teenagers. Therefore, it is important to use validated HRQOL questionnaires to monitor the HRQOL in these individuals. A recently developed Italian Youth Spine Youth Quality of Life (ISYQOL) questionnaire, which contains 13 items applicable to all patients and 7 items for those with a brace, has demonstrated good psychometric properties for measuring HRQOL in children with AIS, and has been translated into multiple languages. This study aimed to culturally adapt this questionnaire to traditional Chinese in Hong Kong and to evaluate its psychometric properties.

Methods: The original ISYQOL was translated into traditional Chinese using the established forward-backward translation method. An expert panel of scoliosis experts and translators was formed to verify the semantic and conceptual equivalence of the translated questionnaire. The backward translated questionnaire was then sent to the original developer for comment prior to refining the questionnaire. Three adolescents with AIS with and three without brace tried the questionnaire to verify their understanding of the translated items. Then, a consecutive sample of 99 female and 34 male conservatively treated volunteers (mean age 13.9 ± 2.1 years; Table 1) were recruited from a scoliosis clinic in Hong Kong to complete the translated ISYQOL (ISYQOL-TC) and the Chinese version of the Scoliosis Research Society-22 refined (SRS-22r) questionnaires, 9-item Patient Health Questionnaire (PHQ-9), 7-item Generalized Anxiety Disorder scale (GAD-7), and 11-item numeric pain rating scale (NPRS). The participants repeated the ISYQOL-TC and SRS-22r two weeks later to evaluate the test-retest reliability. Cronbach's alpha, Rasch measurement models, and intra-class correlation coefficients ($ICC_{3,1}$) were used to evaluate the internal consistency, unidimensionality, and test-retest reliability of the ISYQOL-TC, respectively. Pearson correlation coefficients were used to quantify the concurrent validity with the SRS-22r, convergent validity with PHQ-9, GAD-7, and NPRS, and discriminant validity with the Simplified Coping Style Questionnaire (SCSQ).

Results: The ISYQOL-TC demonstrated good internal consistency (Cronbach's alpha 0.90 and 0.89 for the items 1-13 (for those without brace, n=76) and items 1-20 (for participants with brace, n=57), respectively). Test-retest reliability was excellent ($ICC_{3,1}$=0.95; standard error of measurement ranging from 1.25 to 1.49; minimal detectable change with 95% confidence ranging from 3.47 to 4.14). The Rasch analysis showed that ISYQOL-TC displayed unidimensionality for the first 13 used in all patients and for all 20 items used with bracing. The ISYQOL-TC showed satisfactory correlation with the SRS-22r total (r=0.65; $P < 0.05$; Table 2). The ISYQOL-TC scores showed significant but weak negative correlations with PHQ-9, GAD-7, and NPRS scores (r=-0.34 to -0.43; $P < 0.05$; Table 4), Conversely, ISYQOL-TC scores did not discriminate between different SCSQ scores.

Conclusions: The ISYQOL-TC is semantically and conceptually consistent with the original ISYQOL. It displayed good internal consistency and test-retest reliability. The ISYQOL-TC total scores were moderately correlated with SRS-22r scores. It also demonstrated satisfactory construct validity. Therefore, ISYQOL-TC is suitable for evaluating HRQOL in teenagers with AIS who read traditional Chinese. Future prospective studies should evaluate the responsiveness of ISYQOL-TC in Chinese teenagers with AIS.