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ISYQOL: A RASCH CONSISTENT QUESTIONNAIRE FOR MEASURING HEALTH RELATED QUALITY OF LIFE IN ADOLESCENTS WITH SPINAL DEFORMITIES.

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Background

Spinal deformities are usually associated with poor quality of life (QoL). Several questionnaire have been developed to evaluate QoL in idiopathic scoliosis (the SRS-24, SRS-22, the SQLI and the EOSQ for early onset scoliosis), and some questionnaires have been developed to measure specific dimension of the spinal deformity, like the body image (SAQ) the impact of brace like the BSSQ and BrQ questionnaires. Rasch analysis is a statistical methodology to develop good quality QoL questionnaire, able to make them interval instead of ordinal measures with obvious clinical and research advantages. Only the SRS -22, has been evaluated with Rasch analysis, but showed poor clinimetric properties after Rasch analysis application(2).

Objective

The main aim of the present research is to develop a new questionnaire (ISYQOL: Italian Spine Youth Quality of Life questionnaire) able to satisfy the fundamental requirement for Rasch analysis.

Methods

A multistage classical methodology has been used, including:

- A content analysis of the messages posted by adolescents with spinal deformities in an internet forum specifically developed in 2006 (containing 5758 visitors' posts and 1156 answers from expert clinicians), guided the items selection.
- An opinion poll among 23 experts provided a first version of the questionnaire, starting from 50 possible items.
- This first draft of the questionnaire, 50 questions, was tested in 94 patients.
- A Rasch analysis guided the generation of a second version of the questionnaire (23 questions) that was tested again in 39 patients, to verify its validity.
- A final study, with 402 participants who self-filled one of the two versions of the ISYQOL questionnaire in the waiting room, immediately before medical evaluation.

Statistics: Rasch analysis was performed by using Winsteps Rasch Measurement software (2009, version 3.69.1; partial credit model).

Results

After Rasch analysis, 20 items fitted the model and constituted the final version of the ISYQOL questionnaire. Differential Item functioning was significant for brace (-0.87 vs -1.62 logit, respectively; $p = 0.0015$), thus allowing comparison among patients with and without brace.

The principal component analysis on Rasch residual confirmed the unidimensionality of the ISYQOL. The finding of an additional variable hidden in the ISYQOL Rasch residuals (1st factor Eigenvalue = 2.2) explains 5.2% of the total data variance.

Participant reliability of ISYQOL is 0.83 and thus ~3 significantly different strata can be discerned in the sample population.

Conclusion

The present work presents the Italian Spine Youth Quality Of Life (ISYQOL) questionnaire, the first questionnaire developed in the Rasch analysis to measure HRQOL in adolescents with an idiopathic spine deformity. Being Rasch consistent, ISYQOL offers an HRQOL measure which is additive, generalizable and unidimensional thus complying with requirement of a genuine continuous measure. ISYQOL can offer an insight on the impact of the brace prescription on HRQOL given that it makes easier the comparison of HRQOL between patients with and without the brace and in the same patient before and after the brace prescription.

Reference

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2. Caronni A, Zaina F, Negrini S. Improving the measurement of health-related quality of life in adolescent with idiopathic scoliosis: the SRS-7, a Rasch-developed short form of the SRS-22 questionnaire. *Res Dev Disabil*. 2014 Apr;35(4):784–99.