The 16-item version of the SRS-instrument shows better structural validity than the 20-item version in young patients with spinal deformity

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Introduction

Previously, in patients with adult spinal deformity, 16 of the non-management items of the SRS-instrument showed a significantly better fit to the theoretical four-factor model (pain, function, self-image, mental health) than did all 20 items[1]. The worst-fitting item per domain was recommended for exclusion (Q17, sick days; Q15, financial difficulties; Q14 personal relationships; Q3, nervous, respectively), producing a shorter 16-item version. Whether the same phenomenon is observed in data from younger patients, for whom the questionnaire was originally designed, is not currently known.

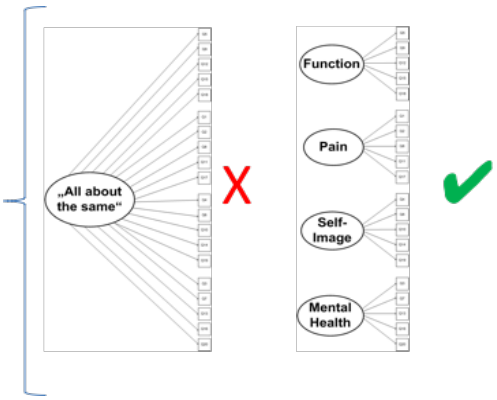
Aim of the study: to evaluate the structural validity of the shorter 16-item version compared with the original 20-item instrument in young patients with spinal deformity, and to evaluate its equivalence across different language versions.

Methods

- This was a secondary evaluation of previously collected data and involved a cross-sectional analysis of the SRS-instrument's factor structure.
- Questionnaire data were available from **3605** adolescents with spinal deformity (75% female; mean age 14.9±2.2 y) who were otherwise participating in various observational studies or spine surgery registries.
- The language versions included:
  - 2746 English
  - 274 Spanish
  - 265 German
  - 223 Italian
  - 97 French
- Confirmatory factor analysis (FA) was performed on the 20 non-management items of the questionnaire to compare the fit of the data to a 20-item single-factor structure, a 20-item 4-factor structure, and a 16-item 4-factor structure.
- Models were compared by analysing their "goodness of fit" (good model fit = root mean square error of approximation (RMSEA) ≤0.05, and comparative fit index (CFI) ≥0.90)
- Equivalence of item-loading was compared across languages.

Results I

- The SRS-22 factor structure showed a significantly better fit to a four-factor solution than to a unifactorial solution (Δ Chi2(7) = 7517.8, p < 0.001).



Results II

- Compared with the 20-item version, the 16-item solution significantly increased the fit (p<0.001) across all language versions, to achieve acceptable model fit (CFI=0.96, RMSEA=0.06; Figure 1).
- For both 16-item and 20-item models, equivalence across languages was not reached, with some items showing weaker item-loading for some languages, in particular the German-language version.

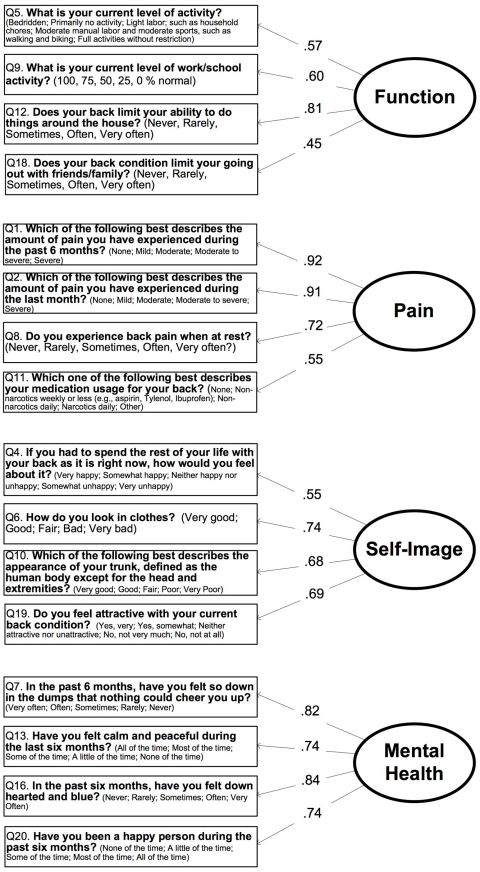


Figure 1: Results of CFA, 16 items on SRS-instrument

Conclusion

Also in patients with adolescent idiopathic scoliosis, the shorter version of the SRS-instrument showed a better fit to the intended 4-factor structure. The wording of some of the items, and/or their equivalence across language versions, may need to be addressed. Questionnaire completion can be a burden for patients; if a shorter, more structurally valid version is available, its use should be encouraged. This shorter version of the SRS-instrument, with removal of ill-fitting items, should deliver more meaningful information on patient-reported outcomes and may also serve to improve compliance with questionnaire completion.

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