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Patient Evaluation

Reliability and Validity Testing of a Danish Translated Version of Spinal Appearance Questionnaire (SAQ) v 1.1.

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Abstract

Study Design: Cross-sectional.
Objective: To develop a psychometrically reliable and valid Danish version of the Spinal Appearance Questionnaire (SAQ).
Summary of Background Data: The SAQ was developed as a disease-specific measure of quality of life in patients with adolescent idiopathic scoliosis (AIS), specifically for younger patients, as it has more visual cues than verbal questions. A reliable and valid Danish Version is not available.
Methods: A Danish version of the SAQ was developed using previously published and widely accepted guidelines. The final Danish SAQ and the Danish SRS22-R were administered to 78 AIS patients two weeks apart. Baseline and follow-up scores were compared. Cronbach's α and intraclass correlations were used to determine reliability. Correlation of SAQ domains with SRS-22R domains was calculated. Discriminative properties were compared by computing effect size and standardized response mean.
Results: Fifty-one patients returned both the baseline and follow-up questionnaires, with an average age 16 ± 3 years and 40.8 ± 28.8 days between baseline and follow-up. There were no floor or ceiling effects for SAQ Appearance. There was a low floor effect and moderate ceiling effect for SAQ Expectations. There was good to excellent internal consistency within each domain.
Conclusion: This purpose of this study was to translate and validate a Danish version of the SAQ. Although problems were identified with items 7 and 8, the Danish SAQ is reliable and valid.

Keywords: Spinal Appearance Questionnaire; Idiopathic scoliosis; Spinal deformity; Validation; Cross-cultural adaption

Introduction

Adolescent idiopathic scoliosis is a three-dimensional disease of the spine, affecting primarily girls in the adolescent period of life. The deformity affects the symmetry of the body, the ribs, the spine and the hips, and the patients' primary concern is often the cosmetic complications of the disease. Untreated, the disease can develop into severe deformation of the spine, pulmonary impairment, and a loss of balance. Spinal appearance is a major concern for the patients and their parents and has been shown to influence health-related quality of life [1].

The Spinal Appearance Questionnaire (SAQ) was developed and validated by Sanders [2] in 2007, based on the Walter Read Visual Assessment Scale [3,4]. The SAQ was designed for administration to a younger population of patients with AIS, as the majority of items use visual cues instead of words to measure the degree of deformity.

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In a more recent factor analysis [5], items with low or negligible correlations with the Lenke scoliosis curve types were discarded. From the 32 items of the SAQ, 15 items loaded on two factors with consistent and significant correlations across all Lenke curve types. There is an Appearance (Items 1–10) and an Expectations factor (Items 12–15). Responses are summed giving a range of 10 to 50 for the Appearance domain and 4 to 20 for the Expectations domain. This revised SAQ showed good internal consistency and test–retest reliability for both Domains and Total score.

The Appearance domain consists of 10 items, each illustrated by 5 drawings, showing differing severity: Body curve, Rib prominence, Flank prominence, Head chest hips, Position of head over hips, Shoulder level, Shoulder blade rotation, Shoulder angle, Head position, and Spine prominence. The Expectations domain has four items pertaining to wanting to be more even, have more even shoulders, have more even hips, and have more even waist—each answerable with a five-point Likert-type scale. The SAQ has been tested and validated [5] and has been found to be reliable and have good internal consistency and discriminant validity. It can discriminate between the patients who require surgery from those who do not and has been found to have a strong correlation to the radiological magnitude of the deformity [5,6]. Previous translations and cross-cultural adaptions have been published [7-9]. The purpose of this study was to produce a reliable and valid Danish translation of the SAQ and validate it in a cohort of AIS patients.

Methods

The methodology and guidelines for cross-cultural validation and adaption of health-related quality of life measures were used in this study [10]. For the forward translation, a spine surgeon, a research nurse, and a tradesman, all of whom had Danish as their native language and were fluent in both spoken and written English, were given the SAQ in English, in its original layout [5]. Each were asked to independently translate the SAQ into Danish. An expert committee of two spine surgeons, a nurse, and a language professional evaluated each translation. The committee synthesized the translations, and a draft version of the Danish SAQ was created.

Three translators, all with English as their native language and fluent in both written and spoken Danish, working independently, were asked to translate the draft Danish SAQ into English. The translators did not receive any information about the translation process and had no knowledge of the questionnaire nor the purpose of the cross-cultural adaption. Each backward translation was evaluated and compared to the original English SAQ by the expert committee. After assessing both the forward and backward translations, a prefinal version of the Danish SAQ was created.

Pretesting

The prefinal Danish SAQ and a validated Scoliosis Research Society-22R (SRS-22R) [11] was sent to a cohort of 50 patients with AIS, previously treated at the University Hospital in Odense (OUH) with either a Boston brace or posterior spinal fusion with segmental instrumentation. A short letter introducing the purpose of the study was included in the packet with the questionnaires. Patients were instructed to skip any item they did not understand and to write in comments regarding any of the items that seemed confusing or problematic. The mean age of the respondents was 17.3 years (range = 13–21 years). A total of 41 patients (82%) returned their questionnaires. Respondent replies were evaluated for missing answers and confusing items. Ten respondents who had extensive comments on the SAQ were contacted for an interview. We identified problems with Items 7 (Shoulder blade rotation) and 8 (Shoulder blade angle), as 10 (25%) of the respondents indicated that they were unable to answer these items without standing with their back against a mirror and turning their heads. They understood the intent of the items, but they had no perception of the relationship between their spinal deformity and the position of their shoulder blades. After review by the expert committee, no changes were made to the prefinal version and this was deemed the final Danish version of the SAQ and was tested for reliability and validity.

Final testing

The final version of the Danish SAQ and a validated SRS22-R [11] were administered to 78 AIS patients in a validation study. The SRS 22-R was administered concurrently in order to determine the convergent validity. Patients completed an initial baseline questionnaire including both SRS22-R and SAQ and, where possible, a second questionnaire during a follow-up visit. None of the patients had any active treatment between the two administrations. Fifty-one patients completed both the initial and the second questionnaire and were included in this study.

The SRS-22R [12] includes 22 items that are divided into five domains: Pain, Self-Image, Function, Mental Health, and Satisfaction with Management. A subtotal score, excluding Satisfaction, and a total score of all items were calculated. Each domain is an average of the related items and is based on a Likert-type scale rating of 1 to 5, with higher scores indicating better outcomes [13]. Missing values within the items of the domains were allowed if they were limited to no more than two.

The SAQ was scored using the factors and methodology identified by Carreon [5]. A total score and the score of two domains were also calculated. In all cases, the sum of the valid items, scaled to the maximum value, was used to create the scale. The Appearance domain was based on Items 1 to 10, had a score ranging from 10 to 50, and could