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## A Rasch-Validated Questionnaire for Evaluating Adherence Predisposition to Scoliosis Specific exercises in Adolescents with Idiopathic Scoliosis: Preliminary Results

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### Background

Scoliosis Specific Exercises (SSE) have shown promising results in the conservative treatment of adolescents with idiopathic scoliosis (IS). Adherence to a prescribed home-based SSE program is crucial for treatment success. However, validated tools measuring patients' predisposition to adhere to such programs are lacking. Early identification of adherence-related facilitators and barriers may help clinicians tailor interventions and optimise outcomes.

### Study Design

Cross-sectional study.

### Objective (s)

To develop a Rasch-consistent questionnaire assessing adolescents' predisposition to adhere to a home-based SSE program.

### Methods

The questionnaire development followed a multi-stage process. First, a qualitative formal content analysis was conducted on responses to an online survey administered to a Scoliosis Treatment Expert Group (STEG) composed of adolescents with IS, their parents and healthcare professionals experienced in scoliosis management (physicians, physical therapists, and a psychologist). The aim was to identify perceived facilitators and barriers to adherence to generate an initial item pool. Second, the STEG assessed the relevance and appropriateness of the generated items. Third, the resulting questionnaire was administered to adolescents with idiopathic scoliosis aged 10 -18 years with IS and a prescription for SSE. Finally, Rasch Analysis (RA) was applied to assess psychometric properties and refine the scale.

### Results

We collected responses from 110 adolescents (mean age  $14.3 \pm 4.5$  years), 93 parents ( $48.7 \pm 4.5$  years), 17 physicians ( $49.8 \pm 9.0$  years), 33 physiotherapists ( $38.9 \pm 11.0$  years), and one psychologist, yielding approximately 15,300 words of text. Qualitative analysis led to an initial pool of 45 items. Following STEG evaluation, 33 items rated on a 5-point Likert scale were retained and administered to 79 adolescents with IS (mean age  $15.05 \pm 1.68$  years). RA produced a 24-item scale with good model fit and orderly category functioning. Separation Reliability was 0.88, indicating good measurement precision. RA also revealed a meaningful secondary dimension, suggesting that the questionnaire captures two independent motivational processes: Intrinsic Motivation, representing internalised and meaningful engagement in the exercise program, and Extrinsic Motivation, characterised by behavioural adherence driven by external expectations despite scepticism toward therapeutic efficacy. No floor or ceiling effects were observed.

### **Conclusion(s)**

The resulting 24-item questionnaire showed good psychometric properties but is inherently multidimensional. This finding reflects clinical experience in scoliosis treatment: some patients are primarily intrinsically motivated and persist with determination, while others adhere more passively, relying on decisions made by clinicians and parents. In many cases, intrinsic and extrinsic motivations coexist and interact, shaping different levels of adherence. Future refinements should include more challenging and clinically nuanced items to better discriminate true high adherence from perceived adherence.

### **Clinical significance**

This instrument provides a solid foundation for assessing adherence predisposition in adolescents with idiopathic scoliosis and may support more personalised and effective conservative treatment strategies.