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Are Pain Intensity Measures Interchangeable? Agreement among ODI, SRS-22, and COMI in Chronic Low Back Pain with and without Scoliosis

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Background

Pain is a major complaint of patients with musculoskeletal disorders, but its measurement is challenging. Various scales, including the Visual Analogue Scale, Numerical Rating Scale, as well as some questions from the Oswestry Disability Index (ODI) and the SRS-22, are commonly used in the assessment of chronic Low Back Pain (cLBP). Numerical ratings and verbal descriptions could induce patients to give different results and scores.

Study Design

Secondary analysis of an observational cross-sectional study.

Objective (s)

To determine and compare the responsiveness of three pain scales or questions about pain intensity in a group of patients with cLBP with and without scoliosis.

Methods

From the original sample of 1,092 subjects (552 SLBP; 540 LBP), we included all those who completed the questions: self-reported Pain at the moment (question 1 from ODI), Pain in the last month (question 2 of SRS-22), and the GRS for back Pain (question 2a from COMI).

Participants were divided into two pathology groups: scoliosis with cLBP (SLBP) and without scoliosis (LBP). Collected variables included gender, age, body mass index (BMI), and Cobb angle (for the SLBP group only). Self-reported Pain, assessed using one question from each of three questionnaires, was compared as follows: ODI – Pain at the moment, an ordinal variable with six levels ranging from "no pain" to "maximum imaginable pain," converted into an integer variable from 1 to 6. SRS-22 – Pain in the last month, an ordinal variable with five levels from "no pain" to "severe pain," converted into an integer variable from 1 to 5. COMI Back – Pain in the last week, an integer variable from 0 ("no pain") to 10 ("worst pain").

Results

We included 417 subjects. 365 (88%) females and 54 (12%) males, with a mean age of 65 ± 10 years. The dataset comprised 319 subjects in the SLBP group and 98 in the LBP group. Median (IQR) pain levels from the ODI and SRS-22 were 3(1) in both the SLBP and LBP groups, while COMI Back pain scores were 5(3) and 5(4), respectively. Considering all subjects, Spearman's coefficients ranged from 0.50 to 0.69, Kendall's W was 0.74, and ICC was 0.61. Results were very similar between SLBP and LBP groups: Spearman's coefficients ranged from 0.49 to 0.65; Kendall's W ranged from 0.74 to 0.79; and ICC ranged from 0.60 to 0.65. No significant differences were observed between females and males.

	All subjects	Scoliosis + low back pain	Low back pain	p-value
ODI and SRS-22	0.50	0.49	0.55	0.548(ns)
ODI and COMI	0.61	0.61	0.64	0.677(ns)
SRS-22 and COMI	0.69	0.68	0.7	0.788(ns)

	Females	Males	p-value
Scoliosis + low back pain			
ODI and SRS-22	0.48	0.57	0.517(ns)
ODI and COMI	0.6	0.69	0.383(ns)
SRS-22 and COMI	0.68	0.71	0.775(ns)
Low back pain			
ODI and SRS-22	0.54	0.63	0.633(ns)
ODI and COMI	0.61	0.83	0.099(ns)
SRS-22 and COMI	0.7	0.66	0.752(ns)

- Spearman's correlation coefficients between ODI, SRS-22, and COMI pain scores (normalized values).
- All the coefficients were significantly different from zero. The p-value for differences in coefficients between the two groups was calculated using Fisher's z-test. 'ns' indicates a non-significant p-value.

Conclusion(s)

Pain intensity measures demonstrate substantial ordinal agreement and moderate quantitative concordance in adults with cLBP, irrespective of the presence of scoliosis. The intraclass correlation coefficient showed moderate quantitative concordance, suggesting that although the measures overlap substantially, absolute values are not fully interchangeable.

Clinical significance

These findings highlight the importance of methodological consistency and careful interpretation when assessing pain outcomes using different PROMs.