Correlation of Patient-Reported Outcomes Management Information System with Legacy Questionnaires in Pediatric Patients with Spinal Asymmetry and Spinal Deformity

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INTRODUCTION

Patient reported outcome measures (PROMs) are frequently used to improve patient care in orthopedics. While there are multiple measures of physical activity and mobility validated in pediatric patients, their use in patients with spinal deformity has not been well established. Our objective was to validate the use of Patient-Reported Outcomes Management Information System (PROMIS) computer adaptive tests (CATs) for use in pediatric patients with spinal asymmetry and spinal deformity by determining the correlation of legacy PROMs to PROMIS.

METHODS

Pediatric patients diagnosed with adolescent or juvenile idiopathic scoliosis, kyphoscoliosis, or spinal asymmetry completed the SRS-22R,[1] HSS Pedi-FABS activity scale,[2] and PROMIS Pediatric CAT Bank[3] (Mobility, Physical Activity (PA), Pain Interference (PI), Physical Stress Experiences (PhSE)) on outpatient visits at a single institution from July 2018 to February 2019. Spearman's correlation coefficients (ρ) were calculated between the PROMs.

RESULTS

A total of 256 pediatric patients were included in the final analyses. While each patient completed at least one of the PROMs, 4 patients did not complete the HSS Pedi-FABS, 9 did not complete PROMIS Mobility, 5 did not complete PROMIS PhSE, and 12 did not complete the SRS-22R. Significant correlations between PROMs are noted below.

Demographics		N (%)	Mean ± SD
Sex	Male	92 (36%)	
	Female	167 (64%)	
Age (years)			13.5 ± 2.2
Cobb angle (°)			20.0 ± 14.0

Adolescent Idiopathic Scoliosis

PROM	M ± SD (current study)	Possible Range	Interpretation
HSS Pedi-FABS	15.5 ± 7.9	0 – 30	Higher scores indicate higher activity levels
SRS-22R Function	4.8 ± 0.3	0 – 5	Higher scores indicate better function
SRS-22R Pain	4.6 ± 0.5	0 – 5	Higher scores indicate less pain
PROMIS Mobility	54.8 ± 7.3	0 – 100	Higher scores indicate more mobility
PROMIS PI	38.2 ± 8.4	0 – 100	Higher scores indicate more pain interference
PROMIS PA	45.3 ± 8.7	0 – 100	Higher scores indicate more physical activity
PROMIS PhSE	49.2 ± 8.9	0 – 100	Higher scores indicate a greater physical stress experience

		PROMIS			
Legacy PROMs		Mobility	PI	PA	PhSE
HSS Pedi-FABS	ρ	.231***	-.056	.510***	-.047
	n	249	256	256	253
SRS-22R Function	ρ	.501***	-.359***	.282***	-.241***
	n	246	249	249	248
SRS-22R Pain	ρ	.472***	-.655***	-.069	-.579***
	n	245	248	248	247

Note: *** indicates $p < 0.001$.

CONCLUSION

This study suggests that in pediatric patients with spinal asymmetry and spinal deformity, the SRS-22R and PROMIS may be used interchangeably to assess pain (SRS-22R Pain/PROMIS PI).

Several PROMs demonstrated moderate correlations and should be used to complement each other to assess activity, function, mobility, and physical stress:

- SRS-22R Pain / PROMIS PhSE
- SRS-22R Pain / PROMIS Mobility
- SRS-22R Function / PROMIS Mobility
- HSS Pedi-FABS / PROMIS PA

SRS-22R Function had weak correlations to several PROMs, suggesting that assessment of function was partially captured by multiple PROMIS constructs for this specific subpopulation of pediatric patients.

These findings support and add to recent findings by Fedorak et al.[4] and Bernstein et al.[5]

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