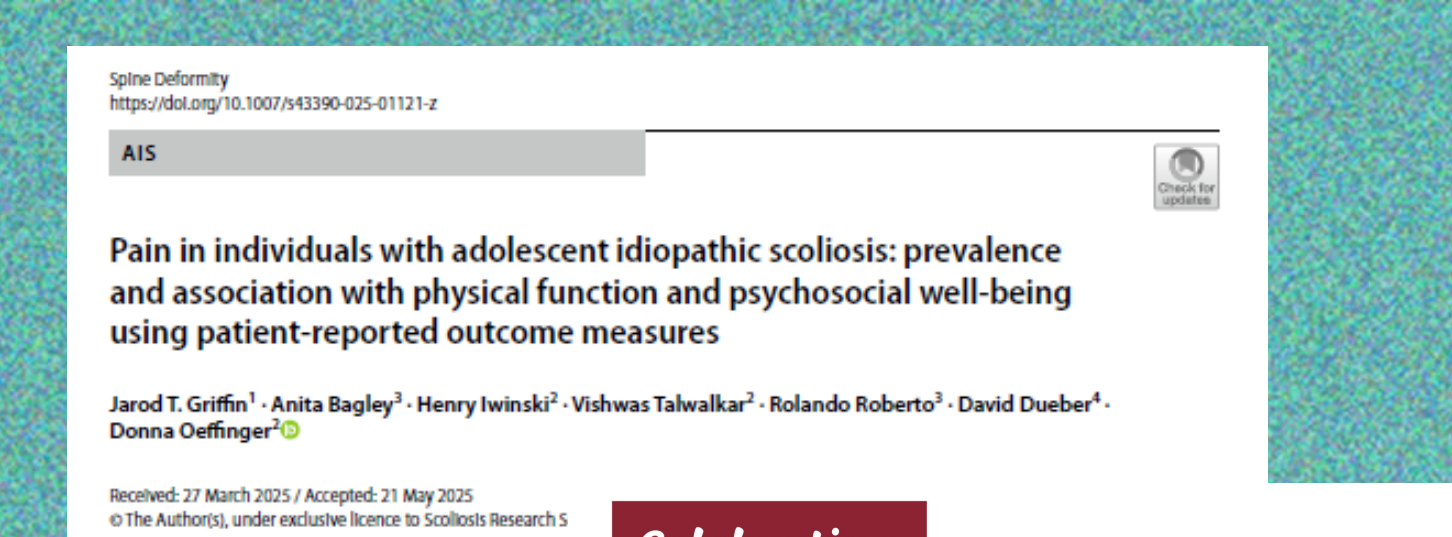




Pain in Adolescent Idiopathic Scoliosis: Prevalence and associations with physical function and well-being

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Objectives:

Pain, although not a primary determinant of treatment for individuals with Adolescent Idiopathic Scoliosis (AIS), can potentially have negative consequences on one's quality of life. PROMIS Pain measures (PROMIS Pain-Intensity and Interference), are increasingly used in care of patients with AIS, yet conflicting evidence and understanding of pain in this population limits clinical utility of these scores. This study examined four pain PROs, pain prevalence and relationships between pain, physical function, and psychosocial well-being in patients with AIS.

Methods:

A convenience cohort of 95 patients (age 14.1±1.7 years; primary curve of 33±13°) with AIS completed patient reported outcomes (PROs) that included four pain-domains, physical function and psychosocial domains (SRS-22r, PODCI, PROMIS). Pain prevalence was defined as percentage of participants exceeding one and two Standard deviations (SD) of normative values. Correlations assessed associations between pain-PRO and other PRO domain scores. Differences in PRO scores between High Pain (HP) and Remaining Cohort (RC) groups, established using interquartile thresholds, were assessed via ANOVA (p<0.01).



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Conclusions:

Most patients did not report pain, yet a subset of patients reported experiencing pain that is problematic. Large variation in pain prevalence rates depended on the selected pain-PRO and threshold, highlighting the importance of clearly reporting the criteria used to define pain in prevalence assessments. HP threshold values can be used to identify patients with HP so that interventions to reduce pain can be incorporated into their treatment plan.

Results:

- Descriptive data for pain-PROs: PROMIS Pain Intensity, Pain Interference, SRS-22r Pain, and PODCI Comfort/Pain are reported in Table 1.
- Pain prevalence ranged from 1% to 37% depending on pain related PRO and defined pain threshold (Norm±1SD or Norm±2SD). Table 1
- PROMIS pain measures moderately correlated with physical function and mental health scores, with PROMIS Pain Interference demonstrating stronger correlations than other pain-PROs. Table 2
- Despite strong correlations among 4-pain PROs, identification of up to 48% of HP patients can be missed if only one measure is used. For example, 63% of patients in Pain-Intensity HP were also in Interference HP, while 52% of HP Pain-Interference patients were also in HP-Intensity. Table 3
- Individuals in the HP groups scored statistically worse on physical function and psychosocial PROs than RC. Figure 1

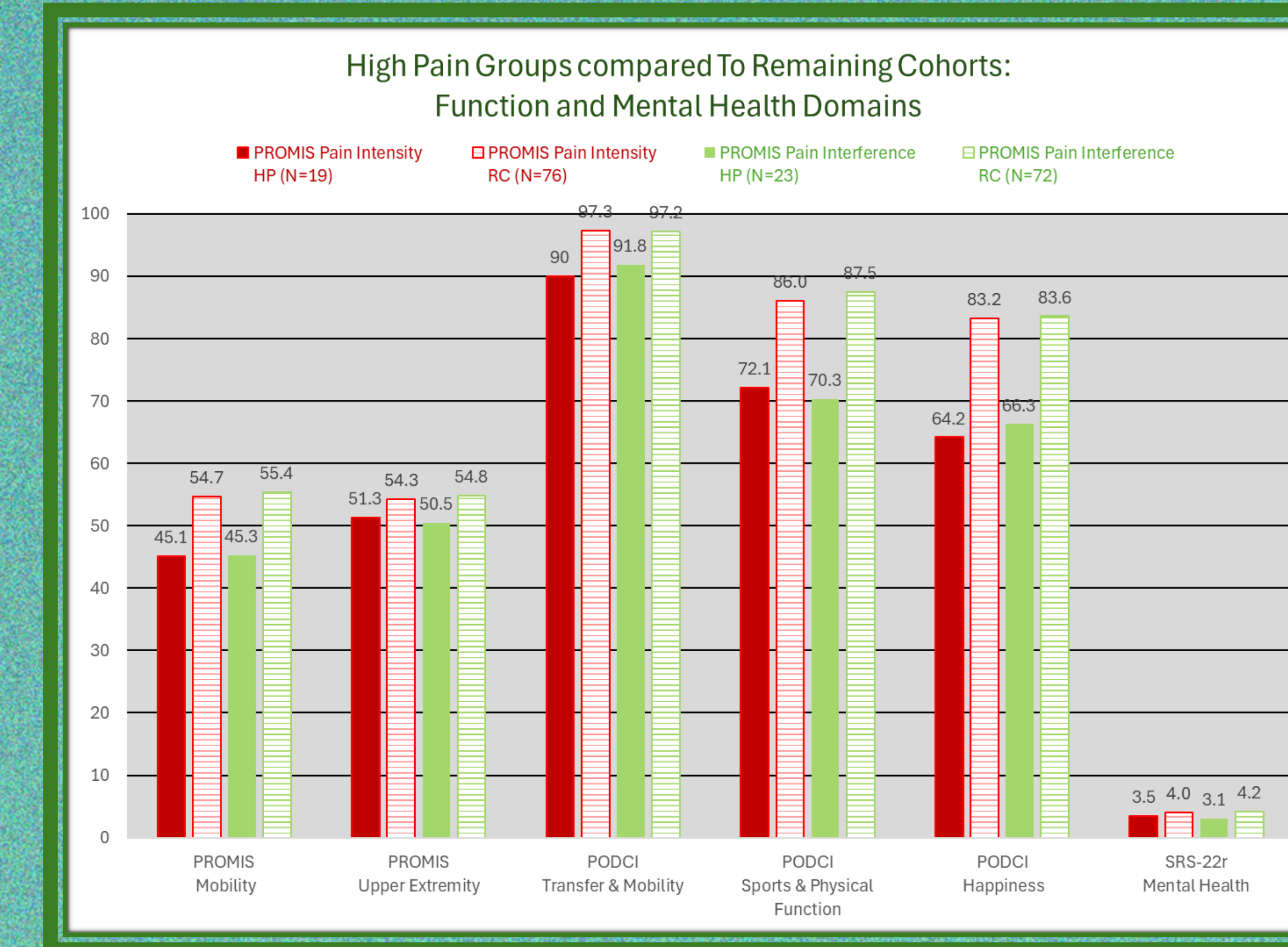


Figure 1: Function and Psychosocial Well-being HP vs RC

Pain Measure	Entire Cohort Mean ± StDev	High Pain Group*	Remaining Cohort	Normal Range Mean ± StDev	Interquartiles Cut-off Values		Cohort Pain Prevalance	
		Mean±SD	Mean±SD		25%	75%	> ± 1 Sdev above Norm	> ± 2 Sdev Above Norm
SRS-22r Pain (HP n=41;RC n=49)	4.1±0.7	3.6±0.6*	4.6±0.3	4.45 ± 0.7 ¹	3.8	4.6	24%	10%
PROMIS Pain Intensity (HP n=45; RC n=50)	2.7±2.4	4.6±2.1*	1.0±0.9	N/A	1.0	4.0	N/A	N/A
PROMIS Pain Interference (HP n=42; RC n=50)	45.0±8.4	50.4±8.3*	40.4±5.1	50 +/- 10	38.6	50.5	5%	1%
PODCI Comfort/Pain (HP n=42; RC n=45)	76.0 ±21.9	63.3±22.4*	88.8±11.7	93 ± 13 ²	62.8	93.3	37%	18%

BOLD: Significant worse than Normal; * Significantly different from RC; Shaded High Pain Threshold Value
¹Daubs (2014) Spine ²Gates (2015) JPO

Table 1: Descriptive Data

Pain Measure	SRS-22r Pain n=22	PROMIS Pain Intensity n=19	PROMIS Pain Interference n=23	PODCI Comfort/Pain n=22
SRS-22r Pain		14 (74%)	16 (70%)	15 (68%)
PROMIS Pain Intensity	14 (64%)		12 (52%)	16 (73%)
PROMIS Pain Interference	16 (73%)	12 (63%)		12 (55%)
PODCI Comfort Pain	15 (68%)	16 (84%)	12 (52%)	

Table 3: Overlap of High Pain Individuals

	SRS-22r Pain	PROMIS Pain Intensity	PROMIS Pain Interference	PODCI Comfort Pain
Physical Function				
SRS-22r Function	0.47	-0.42	-0.61	0.44
PROMIS Mobility	0.51	-0.54	-0.59	0.55
PROMIS Upper Extremity	0.19	-0.29	-0.31	0.36
PODCI Upper Extremity & Physical Function	0.31	-0.35	-0.42	0.45
PODCI Transfer & Mobility	0.26	-0.34	-0.47	0.45
PODCI Sports & Physical Function	0.21	-0.30	-0.51	0.40
Mental Health				
SRS-22r Mental Health	0.38	-0.37	-0.58	0.24
PODCI Happiness	0.37	-0.46	-0.46	0.43
Pain Domains				
SRS-22r Pain Score	1.00	-0.82	-0.61	0.67
PROMIS Pain Intensity	-0.82	1.00	0.59	-0.66
PROMIS Pain Interference	-0.61	0.59	1.00	-0.55
PODCI Comfort/Pain	0.67	-0.66	-0.55	1.00

Table 2: Correlations