

Supplementary Table 2. Methodological Quality and Measurement Property Results

A. Content validity and internal structure

Measure	Country (language)	age group	Content validity			Structural validity (% variance explained)			Cross-cultural validity			Internal consistency					
			n	Result	Rating	Meth qual	n	Result	Rating	Meth qual	n	Result (rating)	Rating	Meth qual	n	Result (Cronbach alpha coefficient)	Rating
APPT	Portugal (Portuguese)	8-17	24 children	Relevance and comprehensibility (patients): assessed with the Q-sort method, 58 words were known by >75% of children, comprehensiveness not assessed.	+	Doubtful				3 Portuguese native reviewers; 2 English native translators	independent translation, back-translation	?	Inadequate				
	Turkey (Turkish)	8-17	10 paediatric pain experts	Relevance (expert): Content validity index (CVI) = 0.8-1.0 (+)	+	Adequate											
	(Özalp Gerçeker et al., 2018)		10 children or adolescents with cancer	Relevance and comprehensibility (patients): assessed with the Q-sort method, 89% of 63 words categorised as "I use this word to describe hurt/ pain" by participants, comprehensiveness not assessed.	+	Doubtful			5 language experts	independent translation, back-translation, experts committee were used to provide cross-cultural validity in the development process	+	Doubtful	96	APPT-T $\alpha=0.78$	+	Adequate	
COMFORT	United States (English)	n.r.	20 experienced clinicians	Experts were only involved before development of scale, relevance and comprehensibility were not explicitly consulted, patients were not involved in content validation.	+	Inadequate	50	PCA: Dimension 1 & 2 (84%) Dimension 1 (58%) Dimension 2 (26%)	+	Adequate			50	$\alpha=0.90$	+	Very good	
	The Netherlands (English)	0-3											158	$\alpha=0.90, 0.92, 0.92$	+	Very good	
	(van Dijk et al., 2000)																
CPI	United States (English/Spanish determined by language use)	3-15.9											35	$\alpha=0.80$ in Anglo children	+		
	(Pfefferbaum et al., 1990, Adams, 1988, Adams, 1989)												43	$\alpha=0.72$ in Hispanic children	+	Adequate	
DEGR	France (French)	2-6				80	Factor 1 (51%) Factor 2 (13,14%) Factor 3 (8, 10%)	+	Doubtful								

OMDQ												
OPS												
Pain Squad	Canada (English)	8-18	10 paediatric oncologists 10 paediatric pain experts	Development (expert): expert opinion was used to develop the tool (+)	+	Doubtful			92	8-18 (N=92) $\alpha = 0.96$	+	Adequate
	(Stinson et al., 2015)		18 adolescents with cancer	Relevance (patients): 88% of questions rated as "important" or "very important" by >50% of adolescents (+)	+	Doubtful						
PBCL	United States (English/Spanish)	3-15.9							35	$\alpha=0.78$ in Anglo children	+	Adequate
	(Pfefferbaum et al., 1990)								43	$\alpha=0.54$ in Hispanic children	-	Adequate
PCT												
PII	United States (English)	6.6-24.1							60	$\alpha = 0.84$	+	Adequate
PII-P	United States (English)	6.6-24.1							65	$\alpha = 0.94$ (mothers) and 0.96 (fathers)	+	Adequate
PPP	Brazil (Brazilian Portuguese)	1-18	20 health professionals 10 primary caregivers/parents	Clarity: median between 3.00 (clear) and 4.00 (very clear); mean= 3.49, SD = 0.82) (+)	+	Inadequate						
	(Pasin et al., 2013)								45	$\alpha = 0.864$	+	Adequate
	United Kingdom (English)	1-18							29	$\alpha = 0.88$	+	Adequate
	(Hunt et al., 2007)											
	United Kingdom (English)	1-18							140	$\alpha = 0.75-0.89$	+	Adequate

		Parent anxiety	35	Divergent validity: Significant r =0.51, p<0.01 in Anglo children	-	Very good					
			43	Divergent validity: Not significant r=not reported in Hispanic children	-	Very good					
	France (French) (Gauvain-Piquard et al., 1987)	2-6					80	Interrater agreement: K=0.14-0.60, significantly different from 0, <0.7; agreement was better for auxiliaries (0.32-0.60) than nurses (0.14-0.53)	-	Very good	
DEGR	France (French) (Gauvain-Piquard et al., 1999)	2-6	pain specialists' ratings	53	Convergent validity: Significant r = 0.74-0.87, p<0.001	+	Very good	152	Interrater agreement: significant weighted kappa coefficients for all items, p<0.001, varied from 0.28-0.45, weighted kappa coefficient for total DEGR score = 0.71> 0.7	+	Very good
			gender	152	Divergent validity: Not significant r = not reported, p >0.05	-	Very good				
			age	152	Divergent validity: Not significant r = not reported, p >0.05	-	Very good				
			psychosocial characteristics	152	Divergent validity: Not significant r = not reported, p >0.05	-	Very good				
			medical characteristics	152	Divergent validity: Not significant r = not reported, p >0.05	-	Very good	53	Interspecialist agreement: K=0.4 (4 specialists)	-	Doubtful
	France (French) (Marec-Berard et al., 2015)	2-6	HEDEN	59	Convergent validity: r = 0.50	-	Very good				
			HEDEN	48	Convergent validity: r = 0.6	-	Very good				
DOLLS	Lebanon (Arabic) (Badr Zahr et al., 2006)	4-10	Scores before procedure	45	Divergent validity: Significant t = 12.45, p<0.01	+	Very good	WBS 45	Concurrent validity: Significant r = 0.90, p<0.01	+	Very good
			heart rate	45	Convergent validity: Significant r = 0.78, 0.89, 0.74, p<0.001	+	Very good				
			systolic blood pressure	45	Convergent validity: Significant r = 0.75, 0.81, 0.79 p<0.001	+	Very good				
			oxygen saturation	45	Convergent validity: no correlation DOLLS and are not correlated	-	Very good				
			OSBD-R (parents)	45	Convergent validity: Significant r = 0.76, p<0.01	+	Very good				
			WBS (parents)	45	Convergent validity: Significant r = 0.81, p<0.01	+	Very good				
			FLACC (nurses)	45	Convergent validity: Significant r = 0.82, p<0.01	+	Very good				
			OSBD-R (nurses)	45	Convergent validity: Significant r = 0.80, p<0.01	+	Very good				
FLACC	United States (English)	<1-7	postanalgesia scores	89	Divergent validity: Significant Preanalgesia FLACC scores (7.0+/-2.9) are significantly higher than that postanalgesia at 10, 30, 60: (1.7	+	Adequate	89	Interrater agreement: r = 0.94, kappa value >0.5; face: kappa = 0.52; legs: kappa = 0.67;	+	Very good

	use)	1989 Faces Scale																	
	(Pfefferbaum et al., 1990)		CPI	35	Convergent validity: r=0.66, P<0.001 in Anglo children	-	Very good												
				43	Convergent validity: r=0.64, P<0.001 in Hispanic children	-	Very good												
	United States (English)	6-18	Patient self-rating of pain	22	Convergent validity: significant r=0.49, 0.53, 0.21, p<0.001, P<0.001, not significant	-	Doubtful							22	Interrater agreement: r = 0.64, 0.80, 0.86, p <.01	?	Doubtful		
	(LeBaron and Zeltzer, 1984)		Observer rating of pain	22	Convergent validity: significant r=0.42, 0.64, 0.45, p<0.001	-	Doubtful												
PCT	United States (English)	5-13	WBS (parent)	30	Convergent validity: Kendall's = 0.7 (PCT parent) P=0.0001	+	Doubtful						30	Interrater agreement: not significant, value not reported	?	Doubtful			
	(West et al., 1994)		OPS (nurse)	30	Convergent validity: Kendall's = 0.0.27 (PCT patient) P=0.09	-	Doubtful		WBS	30	Concurrent validity: significant Kendall's=0.67, P=0.0001	-	Doubtful	30	Intrater agreement: Kendall's = 0.23, p=0.16	?	Doubtful		
PII	United States (English)	6.6-24.1	PII-P	60	Concurrent validity: r = 0.62, P<0.0001	-	Very good												
	(Martin et al., 2015)																		
PII-P	United States (English)	6.6-24.1							PII (self-report)	60	Concurrent validity: r = 0.62, P<0.0001	-	Very good						
	(Martin et al., 2015)																		
	United Kingdom (English)	1-18												140	Interrater agreement: ICC=0.74-0.89	+	Adequate		
	(Hunt et al., 2004)																		
PPP	United Kingdom (English)	1-18	Saliva cortisol concentration	29	Concurrent validity: rs=0.375-0.451	-	Very good		NRS	29	Concurrent validity: r = 0.91	+	Very good	3	Interrater agreement: ICC= 0.62 (95%CI: 0.54-0.70) for a single rater; 0.83 (95%CI:0.78-0.88); range: 0.21-0.71, average: 0.45	+	Adequate		
	(Hunt et al., 2007)														Intrater agreement ICC=0.90 (95%CI: 0.80-0.95, range: 0.21-1.0, average: 0.72)	+	Adequate		
	Brazil (Brazilian Portuguese)	1-18													test-retest: Adequate stability over time: no significant difference between test and retest (P = 0.271)	-	Doubtful		
	(Pasin et al., 2013)																		
RPS	Canada (English)	5-10							FPS-R	49	Concurrent validity: r = 0.96 (first), 0.97 (second), 0.93 (third) clinic visit κ = 1.0 (first), 0.95 (second), 0.87 (third) clinic visit	+	Very good	49	Interrater agreement: Exact agreement between choices made by the participants on both scales: 92% (first), 91% (second), and 87% (third) clinic visit	+	Doubtful		
	(Mahon et al., 2015)																		
SSPedi	Canada (English)	8-18.7	SSPedi scores of more and	502	Divergent validity: Significant Mean difference = 7.8 (95% CI=6.4 to 9.2)	+	Very good							502	test-retest: ICC = 0.88 (95% CI=0.82 to 0.92)	+	Adequate		

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