Pain catastrophizing in children with chronic pain and their parents: Proposed clinical reference points and reexamination of the PCS measure

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ABSTRACT

The current study aimed to validate the child and parent pain catastrophizing scale in a large chronic pain sample and to identify child pain catastrophizing clinical reference points. Patients and parents ($n = 697$) evaluated at a pediatric pain program completed the Pain Catastrophizing Scale, child (PCS-C) and parent (PCS-P) reports, along with additional measures of psychological functioning. The measure's psychometric properties were examined, as were relations across demographic, pain, and psychological characteristics and pain catastrophizing. Clinical reference points were identified for the PCS-C from differences in pain catastrophizing across levels of disability, depressive symptoms, and anxiety. Overall, we did not find support for the hypothesized 3-dimension structure, and we recommend potentially removing items 7 and 8 for both the PCS-P and PCS-C as a result of floor/ceiling effects. The 11-item PCS-C is most parsimonious as a unitary construct, while the 11-item PCS-P comprises 2 factors. Although parent catastrophizing was significantly associated with child outcomes after controlling for pain level, it was no longer significant when accounting for child catastrophizing. When comparing PCS-C scores based on child outcomes, significant differences emerged for low, moderate, and high catastrophizing levels. It appears that the influence of parent catastrophizing on outcomes can be explained through its impact on child catastrophizing levels. PCS-C reference points derived from this large sample can aid clinicians in assessment and treatment planning, in turn increasing the utility of the PCS-C for both clinical and research purposes.

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1. Introduction

Pain catastrophizing is a cognitive attributional style characterized by a negative mind-set, magnification, and rumination about pain [28]. Pain catastrophizing is an important psychological construct in pediatric chronic pain assessment, measured by the Pain Catastrophizing Scale, child (PCS-C) and parent (PCS-P) reports [7,11]. Catastrophizing in children has been linked to poor functioning and higher pain levels [7,12,26] and has been identified as a significant predictor of persistent pain and central sensitization into young adulthood [35].

Additionally, higher levels of parents' catastrophic thinking regarding their children's chronic pain are associated with a greater tendency to restrict their children's pain-inducing activity [3] and a greater tendency to prioritize attempts to control their children's pain [2]. Parents' pain catastrophizing has also been found to be a mediating factor between protective parental responses and levels of disability [12,18,36]. Parent and child catastrophizing have been found to be highly concordant, with high levels strongly associated with poor patient outcomes [19].

Despite growing evidence of the importance of assessing and targeting child and parent catastrophizing, the constructs have not been thoroughly validated with English-speaking children with chronic pain. The original PCS-C was validated with Dutch-speaking healthy children and a small Dutch pediatric chronic pain sample [7], while the PCS-P was validated with Dutch-speaking caregivers of children with chronic pain [11]. The Dutch PCS-C and PCS-P maintained the 3-factor structure of the adult version [27] that has been widely used. PCS-C factor validity was also tested in a community population of English-speaking children

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[20], with results suggesting a revised 3-factor structure with removal of 2 items. Although the English version of the PCS-C and PCS-P are extensively used for clinical and research purposes, to our knowledge, each measure's item variability and factor structure have never been examined among English-speaking children with chronic pain or parents of children with chronic pain. Furthermore, there are no validated reference points for clinically elevated levels of pain catastrophizing in youth.

This analysis evaluates the psychometric properties of the English version PCS-C and PCS-P with a large sample of pediatric chronic pain patients and their parents. In addition, it explores the following: (1) whether demographic variables and pain characteristics differ across pain catastrophizing levels for children and for parents; (2) whether child and parent pain catastrophizing uniquely contributes to child outcomes of disability, depressive symptoms, and anxiety symptoms; and (3) whether we can establish valid clinical reference points for the PCS-C.

We hypothesized that the 3-factor structure of the parent and child PCS would be upheld and that pain catastrophizing levels would not differ significantly by demographic variables, but that higher pain levels would relate to higher levels of catastrophizing. We also hypothesized that both child and parent catastrophizing would uniquely predict child outcomes. Last, we hypothesized that, consistent with previous research establishing clinical reference points for related constructs [14,25], tertiles of high, moderate, and low catastrophizing groups would differ significantly across child outcomes, suggesting potential clinical reference points for children with chronic pain.

2. Methods

2.1. Procedure

All measures were completed for clinical purposes as part of an initial multidisciplinary evaluation. Data for this analysis were extracted from a large institutional review board–approved retrospective record review examining pain-related psychological factors in children and adolescents with chronic pain. Questionnaires are mailed to families before the child's headache/pain clinic evaluation. Parents and children are asked to complete measures separately and bring them to the clinic evaluation. Children at the Pediatric Headache Program were evaluated by a neurologist and psychologist. Children at the Chronic Pain Clinic were evaluated by a physician, physical therapist, and psychologist. A psychologist reviewed all questionnaire data before the clinical interview.

2.2. Participants

There were 765 records extracted from our ongoing clinical databases. Evaluation dates ranged from September 2008 to March 2013. Only participants with complete PCS-C and PCS-P data were included in this analysis (n = 697 total; 534 from the chronic pain clinic, 163 from the pediatric headache program). Participants were primarily white (92.2%) and female (77.6%), consistent with the population of children seen in this tertiary-care setting (Table 1). Mean age was 13.9 years. Most prevalent primary pain diagnoses included headache (25.6%), neuropathic (eg, complex regional pain syndrome; 22.7%), or musculoskeletal (eg, leg pain; 21.1%). Duration of pain varied extensively, from 1 to 209 months, with a median duration of pain of 15 months (Table 1).

2.3. Measures

Demographic and medical variables. Demographic and medical variables were extracted from patient clinical charts.

Table 1
Participant characteristics (n = 697).

Variable	n (%)
Gender	
Female	539 (77.3%)
Male	158 (22.7%)
Race	
White	642 (92.2%)
Black or African American	17 (2.4%)
Asian	10 (1.4%)
Multiracial	3 (0.4%)
Other	24 (3.4%)
Child's pain diagnosis	
Headache	175 (25.6%)
Neuropathic pain	155 (22.7%)
Musculoskeletal	144 (21.1%)
Back/neck pain	80 (11.7%)
Recurrent abdominal pain	51 (7.5%)
Other (eg, chest pain)	49 (7.2%)
Gynecological or genitourinary	30 (4.4%)
Disability level	
None/minimal (0–12)	173 (25.8%)
Moderate (13–29)	309 (46.1%)
Severe (30–60)	188 (28.1%)

Pain intensity. During the clinic evaluation, patients were asked to provide average pain ratings on a standard 0 to 10 eleven-point numeric rating scale [32]. A 0 indicates no pain at all, while a 10 indicates the most pain possible.

Pain catastrophizing. The PCS-C [7] and PCS-P [11] are validated self-report measures adapted from the Pain Catastrophizing Scale [27] that are used to assess negative thinking associated with pain. The PCS-C and PCS-P include 13 items, which are rated on a 5-point scale ranging from 0 = not at all true to 4 = very true. The items are divided across 3 subscales: rumination (4 items, eg, "When I have [my child has] pain, I can't keep it out of my mind"), magnification (3 items, eg, "When I have [my child has] pain, I keep thinking of other painful events"), and helplessness (6 items, eg, "When I have [my child has] pain, I feel like I can't go on"). Items are summed across subscales to derive a total score ranging from 0 to 52; higher scores reflect higher levels of catastrophic thinking. Internal reliability estimates for the current sample were 0.93 for the PCS-C and 0.91 for the PCS-P.

Functional disability. The Functional Disability Inventory (FDI) [34] is a self-report scale for children and adolescents that assesses difficulty in physical and psychosocial functioning due to physical health. The instrument consists of 15 items concerning perceptions of activity limitations during the past 2 weeks; total scores are computed by summing the items. Higher scores indicate greater disability. Scores ranging from 0 to 12 are classified as no or minimal disability, 13 to 29 as moderate disability, and ⩾30 as severe disability [14]. The FDI has good reliability and validity [5]. Internal reliability for the current sample was 0.90.

Depressive symptoms. The Children's Depression Inventory (CDI) [15] was used to assess child depressive symptoms. The CDI is a 27 item self-report measure where items are rated on a 3-point scale. Higher total scores indicate higher levels of depressive symptoms. Internal reliability for the current sample was 0.88.

General anxiety. The Revised Children's Manifest Anxiety Scale (RCMAS 1 and 2) [21,22] is a well-validated and reliable self-report measure used to assess symptoms of anxiety in children ages 7 to 17. All items, except for the lie scale items, are summed to obtain a total anxiety score. Internal reliability for the current sample was 0.93.

2.4. Statistical analysis

All data were entered and analyzed by SPSS software, version 21, and AMOS, version 21. Descriptive statistics examining item