The Pain Coping Questionnaire short-form: preliminary reliability and validity

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Abstract

Introduction: The Pain Coping Questionnaire (PCQ) has support for its validity and reliability as a tool to understand how a child copes with pain of an extended duration. However, measure length may limit feasibility in clinical settings.

Objectives: The primary goal of this study was to develop a short-form (PCQ-SF) that could be used for screening how children cope with chronic or recurrent pain and examine its reliability and validity.

Methods: The PCQ-SF was developed in a stepwise manner. First, a confirmatory factor analysis was computed using an amalgamated data set from the validation studies of the PCQ (N = 1225). Next, ratings from researchers and clinicians were obtained on PCQ item content and clarity (n = 12). Finally, the resulting 16-item short-form was tested in a pediatric sample living with chronic and recurrent pain (65 parent–child dyads; n = 128).

Results: The PCQ-SF has acceptable preliminary reliability and validity. Both statistical and expert analyses support the collective use of the 16 items as an alternative to the full measure.

Conclusions: The compact format of the PCQ-SF will allow practitioners in high-volume clinical environments to quickly determine a child’s areas of strengths and weaknesses when coping with pain. Future research using larger more diverse samples to confirm clinical validity is warranted.

Keywords: Pain coping, Chronic pain, Adolescents, Children

1. Introduction

Chronic pain is among the most disabling and costly conditions in North America\textsuperscript{5,25,48} and is an exemplar of human suffering.\textsuperscript{5} The prevalence of chronic pain in children and adolescents is estimated at 15% to 25%,\textsuperscript{12,33,34} with 30% to 45% of these children and adolescents experiencing chronic pain that does not diminish over time.\textsuperscript{36} Pain in childhood and adolescence can lead to lifelong adverse effects due to the sensitive nature of their developing nervous systems.\textsuperscript{40,44,51} Moreover, inadequate management of pain in childhood can lead to higher experiences of pain intensity during future painful events.\textsuperscript{5} Children and adolescents experiencing chronic pain also report difficulties in numerous areas of daily life including school functioning\textsuperscript{50} and emotional distress.\textsuperscript{4,26}

The biopsychosocial model of pain has emerged as the most dominant approach to understanding and managing pain as well as restoring function.\textsuperscript{9,24,29} In this model, physical sensations, emotions, behaviours, and social, cultural, and cognitive/evaluative components of pain are seen as interdependent and all contributing to the overall experience of pain. As pain changes and develops from acute to chronic pain, cognitive and behavioural factors begin to take on a more significant role.\textsuperscript{7} A child or adolescent’s choice of coping strategies can have beneficial or detrimental effects on their overall well-being. Adaptive coping strategies, such as information seeking,\textsuperscript{4,39} may lessen negative physical and mental consequences of chronic pain in childhood\textsuperscript{5}; whereas avoidant coping, passive coping, or catastrophizing about the pain is associated with elevated psychological distress,\textsuperscript{11,27,28,38} a more intense pain experience,\textsuperscript{20,43,47} and increased functional disability.\textsuperscript{10,21,31}
The Pain Coping Questionnaire (PCQ) is a 39-item self-report measure for evaluating pain coping in children and adolescents in both clinical and research settings. It consists of 8 subscales that can be categorized into 3 higher-order factors, including approach (composed of information seeking, problem-solving, and seeking social support subscales), problem-focused avoidance (composed of positive self-statements, behavioural distraction, and cognitive distraction subscales), and emotion-focused avoidance (composed of externalizing and internalizing/ catastrophizing subscales). Higher scores indicate higher use of a particular coping strategy or style. The factor structure of the PCQ has been found to be reliable across clinical and nonclinical samples, in various languages, and between child and parent ratings. Moreover, convergent validity has been established with pain intensity, duration, controllability, pain coping effectiveness, pain distress, and anxiety.

Research using the PCQ now includes many diverse pediatric pain samples (eg, sickle cell disease, lupus, juvenile idiopathic arthritis [JIA], and primary care). However, concerns about clinical feasibility of the PCQ has been raised because of its length and similarity in items that may be perceived as repetitive. The 39-item measure may discourage rapport in clinical practice because some patients may feel that the clinician does not believe their initial report (eg, the clinician is trying to “trick” them by asking the same question in different ways). Other well-established pain coping measures, such as the Pain Response Inventory or the Pediatric Pain Coping Inventory, exist; however, both measures are even longer than the PCQ and would therefore pose similar concerns.

This study aims to develop a psychometrically sound and clinically valid short-form of the PCQ to increase its feasibility in both research and clinical samples. This study aimed to achieve this through 2 phases: (1) the development of the PCQ short-form through an analysis of an existing PCQ database to explore reliability and a study of expert opinions on PCQ items to determine content and clarity of items and (2) the preliminary validation of the PCQ short-form (PCQ-SF) through a clinical study to determine comparability with the long-form in a sample of children and adolescents with JIA and their parents.

2. Study 1: development of the Pain Coping Questionnaire short-form

2.1. Materials and methods

Ethical approval for this study was obtained from the research ethics board at the University of British Columbia and Izaak Walton Killam (IWK) Health Centre. Development of the PCQ-SF in study 1 was conducted in 3 steps. There were 2 steps in this study: step 1 was a confirmatory factor analysis (CFA) of an amalgamated data set and then expert guidance. Data from both the CFA and the expert ratings were compared to examine which items should be selected from the short-form. The goal was to generate a short-form based on both statistical and theoretical input.

2.1.1. Participants

The PCQ database (total N = 1225) consisted of 6 samples of children and adolescents from schools and clinics and included 5 separate published studies. The average age across all 6 groups ranged from 7 to 18 years (M = 12.6; SD = 2.01), the grades ranged from 1 to 12 (68% of sample was in grades 7–9), and the sex distribution was almost evenly split (55% female individuals). All clinical samples were recruited from the IWK Health Centre, a tertiary care teaching hospital in Halifax, Nova Scotia, Canada. The following describes the composite samples.

Sample 1 (n = 258) consisted of children from elementary, junior, and high schools in the Halifax (Nova Scotia, Canada) metropolitan area. The average age of participants was 12.7 years (SD = 2.67), and 56% was girls. Sample 2 (n = 75) included children recruited from rheumatology clinics (juvenile rheumatoid arthritis diagnosis; n = 28) or neurology clinics (chronic headache diagnosis; n = 47) at the IWK Health Centre. The average age was 12.29 years (SD = 2.61), and 63% was girls. Participants from sample 3 (n = 648) were randomly recruited from 3 junior high schools in the Halifax area. The average age was 13.02 (SD = 0.93), and 54% was girls. Participants from sample 4 (n = 45) were recruited from a rheumatology clinic at the IWK Health Centre (15 diagnosed with fibromyalgia; 15 with JIA) or recruited from friends of the JIA sample and community. The average age was 14.55 years (SD = 1.86), and 83% was girls. Sample 5 (n = 101) included children undergoing day surgery at the IWK Health Centre. The average age was 9.21 years (SD = 1.76), and 48% was girls. Sample 6 (n = 96) was a subsample of healthy children from a larger study. This community-based sample was randomly selected from a Halifax telephone directory. The average age was 12.61 years (SD = 1.51), and there was an equal distribution of boys and girls.

In step 2 of the study, local pain principal investigators and their research team members were recruited from a metropolitan university and its affiliated children’s hospital. The goal was to gather opinions of individuals well-versed in the research and practice of chronic pain who could provide informed opinions on the suitability of items. Regardless of experience level, to qualify they had to be currently working predominantly in the field of pediatric pain (as a clinician and/or researcher) and have a 4-year Bachelor’s degree or higher. Experts included 6 researcher-clinicians, 5 graduate students, 3 clinician-scientists, 1 professor-administrator, and 1 administrator. The mean number of research experience in years in the pediatric pain field was 7.33 years (SD = 6.09, range = 0–23) and clinical experience was 7.47 years (SD = 8.98, range = 0–30).

2.1.2. Methodology

First, using the abovementioned database, a CFA was completed on the original PCQ long-form as a secondary analysis of existing data sets of PCQ questionnaires from community and clinical samples. Confirmatory factor analysis was used to test how well measured variables (items in the PCQ) represent a specified number of constructs or factors (the PCQ subscales). The CFA was performed using the CALIS procedure in Statistical Analysis System. Missing data were imputed using single imputation with an expectation-maximization algorithm.

A combination of absolute fit indices and relative fit indices was used to confirm the structure of the PCQ. The absolute fit indices indicate how well the proposed model reproduces the data, whereas the relative fit indices compares the proposed model to a null model where all variables are uncorrelated. Absolute fit will be evaluated using the goodness of fit index (GFI), which represents the proportion of variance explained by the estimated population covariance (analogous to an $R^2$ value), and the adjusted GFI (AGFI), which adjusts the GFI for the number of factors in the model. Values of GFI $\geq 0.95$ and AGFI $\geq 0.9$ indicate a good fit. Relative fit indices used in this study will be Bentler–Bonett normed fit index (NFI), Bentler–Bonett non-NFI (NNFI), and the comparative fit index (CFI). All 3 compare model fit relative to a model of completely uncorrelated variables. The
NFI is not affected by the number of parameters in the model, whereas the NNFI takes into account the number of parameters as well as the size of correlations in the data. Finally, the CFI is an adjusted form of the NFI that performs well with all sample sizes. The criterion for all 3 relative indices is that they should be equal to or larger than 0.9 to indicate a good fit.

In the second part of the study, the local experts were asked to independently rate each item on the PCQ long-form for content (ie, how well did the item reflect the subscale to which it belonged) and clarity (ie, how clear and easy to understand would the item be to patients and their families). Ratings were scored on a scale from 1 to 7, with higher scores indicative of relevant content and greater clarity. A repeated measures analysis was conducted on content and clarity ratings for each subscale to determine which items were significantly higher in their ratings.

For final item selection of the PCQ short-form items, priority was given to the highest loading items in each subsection according to the CFA, then the original factor analysis, and, finally, by content and clarity ratings by the local experts.

2.2. Results

2.2.1. Step 1: confirmatory factor analysis

A CFA was performed on the amalgamated PCQ data set, and there was at the most 9% of subjects with missing data. The results of this analysis show a reasonable fit between the model and the data, as shown by the fit indices greater than 0.8 (GFI = 0.88, AGFI = 0.87, CFI = 0.88, NFI = 0.85 and NNFI = 0.87). Therefore, it is reasonable to assume that the structure of the long-form questionnaire applies to the overall population studied. See Table 1 for factor loadings and Table 2 for summary of fit statistics.

2.2.2. Step 2: informed participant opinion

Face validity (ie, content and clarity ratings of items by clinical and research experts in pediatric pain) did not conflict with item choices according to both factor analyses. Any statistically significant conflicts in the content and clarity ratings were not clinically significant. See Table 3 for summary data on item content and clarity.

2.2.3. Step 3: synthesis of confirmatory factor analysis and informed opinion

Results of the CFA and the content and clarity analysis were synthesized to create the suggested short-form version of the PCQ. With very few exceptions, all items had high content and clarity ratings and were eligible for measure inclusion. Internal consistency of the 8 factors was strong with Cronbach alpha scores ranging from 0.75 to 0.83. The criterion for all 3 relative indices is that they should be equal to or larger than 0.9 to indicate a good fit.

In the second part of the study, the local experts were asked to independently rate each item on the PCQ long-form for content (ie, how well did the item reflect the subscale to which it belonged) and clarity (ie, how clear and easy to understand would the item be to patients and their families). Ratings were scored on a scale from 1 to 7, with higher scores indicative of relevant content and greater clarity. A repeated measures analysis was conducted on content and clarity ratings for each subscale to determine which items were significantly higher in their ratings.

For final item selection of the PCQ short-form items, priority was given to the highest loading items in each subsection according to the CFA, then the original factor analysis, and, finally, by content and clarity ratings by the local experts.

3. Study 2: preliminary validation of the Pain Coping Questionnaire short-form

3.1. Materials and methods

Ethical approval for this study was obtained from the research ethics board at York University and the Hospital for Sick Children.
validity that was designed for use with children and adolescents aged 8 to 18 years and for their parents. It requires participants to indicate how often they use a coping strategy using a 5-point Likert scale (1 = never, 2 = hardly ever, 3 = sometimes, 4 = often, and 5 = very often). Parents are asked to report on their child’s use of a coping strategy using the same scale. The measure consists of 8 subscales that can be categorized into 3 higher-order factors, including

### Table 1

Confirmatory factor analysis of the Pain Coping Questionnaire.

| Items                                         | Factors       | IS            | PS            | SSS           | PSS           |
|-----------------------------------------------|---------------|---------------|---------------|---------------|---------------|
| Ask questions about the problem               |               | 0.59 (0.54–0.63) |               |               |               |
| Ask a nurse or doctor questions              |               | 0.66 (0.62–0.70) |               |               |               |
| Find out more information                    |               | 0.78 (0.75–0.81) |               |               |               |
| Learn more about how my body works           |               | 0.63 (0.59–0.67) |               |               |               |
| Focus on the problem and see how I can solve it |               | 0.50 (0.46–0.55) |               |               |               |
| Think about what needs to be done to make things better |           | 0.73 (0.69–0.76) |               |               |               |
| Think of different ways to deal with the problem |               | 0.76 (0.73–0.79) |               |               |               |
| Figure out what I can do about it             |               | 0.74 (0.71–0.77) |               |               |               |
| Try different ways to solve the problem until I find one that works |   | 0.60 (0.55–0.63) |               |               |               |
| Talk to a friend about how I feel             |               | 0.57 (0.52–0.61) |               |               |               |
| Talk to someone about how I am feeling        |               | 0.83 (0.80–0.85) |               |               |               |
| Tell someone how I feel                       |               | 0.75 (0.72–0.78) |               |               |               |
| Talk to a family member about how I feel      |               | 0.70 (0.66–0.73) |               |               |               |
| Let my feelings out to a friend               |               | 0.57 (0.53–0.61) |               |               |               |
| Tell myself, do not worry everything will be ok |   | 0.65 (0.61–0.69) |               |               |               |
| Say to myself, be strong                      |               | 0.70 (0.67–0.74) |               |               |               |
| Tell myself it is not so bad                  |               | 0.71 (0.68–0.75) |               |               |               |
| Say to myself, things will be ok              |               | 0.80 (0.78–0.83) |               |               |               |
| Tell myself I can handle anything that happens | | 0.58 (0.54–0.63) |               |               |               |

### Items

| Items                                         | Factors       | BD            | CD            | E             | I/C           |
|-----------------------------------------------|---------------|---------------|---------------|---------------|---------------|
| Go and play                                   |               | 0.61 (0.57–0.65) |               |               |               |
| Do something fun                              |               | 0.81 (0.79–0.84) |               |               |               |
| Do something I enjoy                          |               | 0.80 (0.77–0.82) |               |               |               |
| Do something active                           |               | 0.70 (0.67–0.73) |               |               |               |
| Do something to take my mind off it           |               | 0.53 (0.49–0.58) |               |               |               |
| Forget the whole thing                        |               | 0.44 (0.39–0.49) |               |               |               |
| Ignore the situation                          |               | 0.67 (0.63–0.70) |               |               |               |
| Try to forget it                              |               | 0.76 (0.72–0.79) |               |               |               |
| Put it out of my mind                         |               | 0.77 (0.74–0.80) |               |               |               |
| Do not think about it                         |               | 0.71 (0.68–0.74) |               |               |               |
| Say mean things to people                     |               | 0.72 (0.68–0.75) |               |               |               |
| Argue or fight                                |               | 0.73 (0.70–0.76) |               |               |               |
| Yell to let off steam                         |               | 0.58 (0.54–0.62) |               |               |               |
| Get mad and throw or hit something            |               | 0.76 (0.72–0.79) |               |               |               |
| Curse out loud                                |               | 0.63 (0.59–0.67) |               |               |               |
| Worry that I will always be in pain           |               | 0.67 (0.63–0.70) |               |               |               |
| Keep thinking about how much it hurts         |               | 0.64 (0.60–0.68) |               |               |               |
| Think that nothing helps                      |               | 0.62 (0.58–0.66) |               |               |               |
| Think that the pain will never stop           |               | 0.74 (0.70–0.77) |               |               |               |
| Worry too much about it                       |               | 0.71 (0.67–0.74) |               |               |               |

All factor loadings were significant. Loadings and their 95% confidence interval included. Items included in the short-form are in italicized typeface.

BD, behavioural distraction; CD, cognitive distraction; E, externalizing; I/C, internalizing/catastrophizing; IS, information seeking; PS, problem-solving; PSS, positive self-statements; SSS, seeking social support.
approach (composed of information seeking, problem-solving, seeking social supports, and positive self-statement subscales), problem-focused avoidance (composed of positive self-statements, behavioural distraction, and cognitive distraction subscales), and emotion-focused avoidance (composed of externalizing and internalizing/catastrophizing subscales). A mean scale score is then calculated for each subscale. The factor structure of the questionnaire has been found to be reliable across clinical and nonclinical samples and between child and parent ratings.37 Moreover, convergent validity has been established with pain intensity, duration, controllability, pain coping effectiveness, pain distress, and anxiety.37 The PCQ short-form is a 16-item abbreviated version of the PCQ. The PCQ-SF maintains the factor structure of the 8 subscales of the PCQ.

### 3.1.4. Data analysis

To test whether the long-forms and short-forms of the PCQ are generally equivalent, 3 separate analyses were conducted. First, to test whether the long-forms and short-forms are related, bivariate Pearson correlations between long-forms and short-forms of the PCQ were conducted across all subscales and higher-order factors for both child and parent report. Next, paired sample t tests were calculated to determine any significant differences between the long and short versions of the PCQ for both parent and child reports. Finally, using the Fisher r to Z transformation, correlations between parent and child report were compared across long-forms and short-forms of the PCQ to demonstrate that the magnitude of the convergence or divergence between reporting is the same. Confirmatory factor analysis was performed to determine whether the PCQ-SF maintained the factor structure of the original PCQ. Two models were evaluated. A first model using the data from children respondents only and a second model using responses from both children and their parents. Maximum likelihood estimation was used for both models. Factor variance was fixed at 1. Covariance between factors was kept as a free parameter. Given the large number of analyses, only P < 0.01 was considered statistically significant. Similar to the CFA in study 1, a combination of absolute fit indices and relative fit indices was used to evaluate the structure of the PCQ-SF. Convergent validity was also explored through bivariate Pearson correlations between parent and child reports of the PCQ-SF and child-reported pain characteristics.

### 3.2. Results

#### 3.2.1. Participants

In total, 65 parent and child dyads completed both short-forms and long-forms of the PCQ. Children were on average age 13.8 years (SD = 2.70), 66.2% was girls, and reported average pain scores out of 10 ranging from 0 to 7 (M = 3.69, SD = 1.99). Parent participants were on average 43.88 years (SD = 7.03) and primarily mothers (81.3% of sample).

#### 3.2.2. Comparison between versions of the Pain Coping Questionnaire and parent and child reports

The long-forms and short-forms of the PCQ were strongly positively associated across all subscales for both child report (range across scales and subscales r = 0.71–0.91; median subscale = 0.83) and parent report (range across scales and subscales r = 0.66–0.92; median subscale = 0.77) across all subscales. No significant differences were found in the subscale means in child’s report between long-forms and short-forms of the PCQ (Table 5). All correlations between parent and child reports were significant and positivity correlated with the exception of cognitive distraction and positive self-statements (Table 6). There were no significant differences in the magnitude of the correlations parent and child reports on the long-forms vs short-forms. These analyses indicate that the parent–child agreement is comparable between forms. Convergent validity analyses revealed that only child-reported worst pain and parent-reported child externalizing were found to be significantly associated (r = −0.391, P = 0.007).

#### 3.2.3. Factor structure of the Pain Coping Questionnaire short-form

The main model of interest is the model of children’s responses only. There was a small number of missing responses (3 in total). Missing responses were imputed using the neutral response “sometimes.” The overall goodness of fit of this model is reasonable with a GFI = 0.85. Moreover, the CFI, which compares the model of interest with a model of uncorrelated variables, also suggests an acceptable fit because it is greater than the 0.9 threshold (CFI = 0.92). Other relative indices also support a reasonable fit because they are also quite large (NFI = 0.79 and NNFI = 0.88), though they do not surpass the 0.9 threshold. The parents-only model similarly shows a reasonable fit (CFI = 0.93, NFI = 0.80 and NNFI = 0.88). This suggests that, despite the limited sample available, the structure captured by the model is robust enough across different types of respondents.

### Table 2

| Model information | Amalgamated sample PCQ | Children only PCQ-SF | Parents only PCQ-SF |
|-------------------|------------------------|----------------------|---------------------|
| No. of observations | 1225 | 65 | 65 |
| No. of variables | 39 | 16 | 16 |
| No. of parameters | 106 | 60 | 60 |
| Hoelter critical N | 319 | 59 | 80 |

| Absolute fit indices | Amalgamated sample PCQ | Children only PCQ-SF | Parents only PCQ-SF |
|----------------------|------------------------|----------------------|---------------------|
| Goodness of fit index (GFI) | 0.88 | 0.85 | 0.84 |
| Adjusted GR (AGFI) | 0.87 | 0.73 | 0.71 |

| Incremental fit indices | Amalgamated sample PCQ | Children only PCQ-SF | Parents only PCQ-SF |
|-------------------------|------------------------|----------------------|---------------------|
| Bentler comparative fit index (CFI) | 0.88 | 0.92 | 0.93 |
| Bentler–Bonett normed fit index (NFI) | 0.85 | 0.79 | 0.80 |
| Bentler–Bonett non-normed index (NNFI) | 0.87 | 0.88 | 0.88 |

PCQ, Pain Coping Questionnaire; PCQ-SF, Pain Coping Questionnaire short-form.
See Table 2 for key fit indices for the 2 CFAs and supplemental materials for the factor loadings of the CFA.

### 4. Discussion

In light of the detrimental effects chronic pain has on both the child and their families, it is imperative to strive to improve current assessment methods of the psychosocial aspects of chronic pain. The primary goal of this study was to develop a reliable and valid short-form of the PCQ that could be used for screening how children cope with chronic or recurrent pain. Findings from this study show preliminary support to the use of the 16-item PCQ-SF as an equivalent alternative to the full measure. The compact format will allow health care providers and researchers to quickly measure a child’s areas of strengths and weaknesses when coping with pain. This may allow for the provision of existing pain coping resources to families who identify maladaptive coping (eg, websites [WebMAP32], apps [iCanCope23,42). Moreover, providing families with short questionnaires asking about pain coping allows for more opportunities for discussion of the impact of pain coping on the pain experience.

The PCQ-SF was developed in a stepwise manner. First, the factor structure of the PCQ was confirmed in a broad sample of pediatric clinical and community samples. Next, PCQ items were rated for item content and clarity by clinicians and researchers with expertise in pediatric pain. These findings informed selection of items for the short-form. An examination of statistical significance elucidated a 16-item PCQ-SF. The PCQ-SF demonstrated acceptable internal consistency similar to that of the original long-form. The resultant PCQ-SF is a 60% reduction in items thereby decreasing patient burden while maintaining subscales of the original PCQ.

In a preliminary validation of the PCQ-SF in a pediatric rheumatology sample, there were no statistically or clinically significant differences between the child’s report of pain coping through the PCQ vs PCQ-SF. Moreover, a recent meta-analysis

### Table 3

| Subscale | Item | Content M (SD) | Clarity M (SD) |
|----------|------|---------------|---------------|
| Information seeking | Ask questions about the problem | 6.60 (0.48)* | 6.44 (0.89)* |
| | Ask a nurse or doctor questions | 5.06 (0.85)* | 5.25 (1.13)* |
| | Find out more information | 5.13 (1.36) | 4.25 (0.93) |
| | Learn more about how my body works | 4.63 (1.15) | 4.88 (1.26) |
| Problem-solving | Focus on the problem and see how I can solve it | 5.25 (0.86) | 5.38 (1.09) |
| | Think about what needs to be done to make things better | 6.25 (0.86)* | 6.38 (0.72)* |
| | Think of different ways to deal with the problem | 6.31 (0.70)* | 6.19 (0.83) |
| | Figure out what I can do about it | 5.934 (1.00) | 5.75 (0.93) |
| | Try different ways to solve the problem until I find one that works | 6.38 (0.89)* | 6.25 (1.24) |
| Seeking social support | Talk to a friend about how I feel | 6.25 (0.86) | 6.31 (0.60) |
| | Talk to someone about how I am feeling | 6.44 (0.63) | 6.44 (0.51) |
| | Tell someone how I feel | 6.31 (0.79) | 6.25 (0.68) |
| | Talk to a family member about how I feel | 6.06 (0.93) | 6.38 (0.72) |
| | Let my feelings out to a friend | 5.06 (1.18)† | 4.88 (1.02)† |
| Positive self-statements | Tell myself, do not worry everything will be ok | 5.31 (1.20) | 5.87 (0.83) |
| | Say to myself, be strong | 4.69 (1.45) | 5.53 (0.83) |
| | Tell myself it is not so bad | 5.00 (1.51) | 6.00 (0.85) |
| | Say to myself, things will be ok | 5.51 (1.30) | 5.80 (0.86) |
| | Tell myself I can handle anything that happens | 5.89 (1.09) | 5.60 (0.99) |
| Behavioural distraction | Go and play | 5.44 (1.21) | 6.07 (1.28) |
| | Do something fun | 5.88 (1.20) | 6.00 (1.36) |
| | Do something I enjoy | 6.00 (0.89)* | 6.07 (0.70) |
| | Do something active | 5.13 (1.31) | 5.33 (1.11) |
| | Do something to take my mind off it | 6.60 (0.60)* | 6.53 (0.64) |
| Cognitive distraction | Forget the whole thing | 4.13 (1.41)† | 4.53 (1.13)† |
| | Ignore the situation | 5.56 (1.31) | 6.20 (0.94) |
| | Try to forget it | 4.69 (1.58) | 5.27 (0.96) |
| | Put it out of my mind | 6.00 (0.73) | 5.87 (0.64) |
| | Do not think about it | 5.89 (1.31) | 6.47 (0.74)* |
| Externalizing | Say mean things to people | 5.06 (1.34) | 6.13 (0.99) |
| | Argue or fight | 5.50 (1.51) | 5.87 (1.19) |
| | Yell to let off steam | 5.06 (1.34) | 5.60 (0.99) |
| | Get mad and throw or hit something | 5.44 (1.50) | 6.47 (0.64) |
| | Curse out loud | 5.13 (1.45) | 6.20 (0.77) |
| Internalizing/catastrophizing | Worry that I will always be in pain | 6.31 (0.87) | 6.73 (0.59) |
| | Keep thinking about how much it hurts | 5.88 (0.81) | 6.60 (0.63) |
| | Think that nothing helps | 5.69 (1.20) | 5.73 (1.10)† |
| | Think that the pain will never stop | 6.30 (0.89)* | 6.80 (0.41) |
| | Worry too much about it | 5.31 (1.14) | 5.67 (1.45) |

Italicized items are those included in the PCQ-SF.  
* Statistically significantly higher score than other items.  
† Statistically significantly lower score than other items.  
M, mean; PCQ-SF, Pain Coping Questionnaire short-form.
of catastrophizing as a pain coping strategy has shown strong relationships to increased anxiety, depression, and lower quality of life in youth with chronic pain conditions. When examining catastrophizing in this sample, it is important to note that the child report scores are near identical (2.25 for the original form vs 2.26 on the short-form, r = 0.88). This highlights the ability of the PCQ-SF to identify coping strategies of highest interest not only clinically but also in research.

The PCQ-SF also demonstrated support for parent report of child coping strategies. Correlations between parent and child reports were not only strong but also comparable in magnitude on the PCQ-SF and the original form. However, statistically significant differences were found between parent report of problem-solving, seeking social support, and cognitive distraction on the PCQ and PCQ-SF. These statistically significant differences in parent report were not clinically significant (differences between long-forms and short-forms on these strategies range 0.21–0.34). Of note, differences in parent report were not clinically significant differences in the convergent validity of the PCQ-SF. These statistically significant differences were found between parent report of child coping strategies. Correlations between parent and child report scores are near identical (2.25 for the original form vs 2.26 on the short-form, r = 0.88). This highlights the ability of the PCQ-SF to identify coping strategies of highest interest not only clinically but also in research.

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Our findings should be interpreted in light of several limitations. One limitation of the study is that participants were homogeneous in diagnosis (rheumatology) and seen in a tertiary care centre. Future research regarding generalizability to different pain samples is necessary in both clinical and community samples. This study also did not explore convergent validity with health outcomes expected to be affected by pain coping such as function and psychological well-being. Future validation including patient-reported health outcomes may lend further support for the use of the PCQ-SF. Children and families were not asked about preferences on completing the long-form vs short-form of the PCQ, which was a missed opportunity. Authors also acknowledge the choice of items for the PCQ-SF was determined by combining theoretical and statistical input but did not use gold standard statistical methods (eg, Item Response Theory). Further studies are required to explore the reliability and validity of the PCQ-SF.

Pain coping strategies affect a child’s everyday functioning with pain. Finding brief and reliable methods to assess a child’s coping quickly will help support appropriate interventions for those with suboptimal pain coping. The PCQ-SF measures the same subscales as the original form and has similar levels of reliability, has internal consistency, and is strongly correlated. This study demonstrates initial findings that support the preliminary reliability and validity of the PCQ-SF. The PCQ-SF may be supportive in identifying maladaptive coping, which can be discussed in clinical settings as well as invite more awareness and conversation about the impacts of pain coping on a child’s

| Table 4: Cronbach Alpha Scores for the long-forms and short-forms of the Pain Coping Questionnaire. |
| --- | --- | --- |
| Subscale | Long-form | Short-form |
| Information seeking | 0.754 | 0.675 |
| Problem-solving | 0.788 | 0.693 |
| Seeking social support | 0.825 | 0.805 |
| Positive self-statements | 0.822 | 0.733 |
| Behavioural distraction | 0.817 | 0.721 |
| Cognitive distraction | 0.779 | 0.739 |
| Externalizing | 0.809 | 0.666 |
| Internalizing/catastrophizing | 0.804 | 0.675 |

| Table 5: Pain Coping Questionnaire long-form and short-form comparison (N = 65). |
| --- | --- | --- | --- | --- |
| Scales and subscale | Long-form Mean (SD) | Short-form Mean (SD) | t | R |
| Child report | | | | |
| Approach | 2.65 (0.80) | 2.71 (0.77) | -1.20 | 0.88*** |
| Information seeking | 2.33 (0.92) | 2.35 (0.83) | -0.29 | 0.81*** |
| Problem-solving | 3.03 (0.91) | 3.09 (1.03) | -0.56 | 0.72*** |
| Seeking social support | 2.59 (1.02) | 2.69 (1.07) | -1.60 | 0.89*** |
| Problem-focused avoidance | 3.10 (0.75) | 3.09 (0.71) | -0.17 | 0.88*** |
| Positive self-statements | 2.74 (1.05) | 2.68 (1.00) | -0.81 | 0.82*** |
| Behavioural distraction | 3.41 (0.96) | 3.28 (1.11) | -1.68 | 0.83*** |
| Cognitive distraction | 3.15 (0.96) | 3.32 (0.89) | -1.90 | 0.71*** |
| Emotion-focused avoidance | 2.06 (0.84) | 2.05 (0.87) | -0.32 | 0.91*** |
| Externalizing | 1.87 (0.95) | 1.84 (0.89) | -0.52 | 0.89*** |
| Internalizing/catastrophizing | 2.25 (0.94) | 2.25 (1.08) | -0.00 | 0.89*** |

Parent report |
| Approach | 2.84 (0.70) | 3.01 (0.72) | -3.14*** | 0.89*** |
| Information seeking | 2.67 (0.80) | 2.65 (0.84) | -0.27 | 0.75*** |
| Problem-solving | 3.05 (0.71) | 3.26 (0.72) | -2.07*** | 0.70*** |
| Seeking social support | 2.81 (0.87) | 3.15 (1.06) | -3.34*** | 0.66*** |
| Problem-focused avoidance | 3.00 (0.65) | 3.04 (0.61) | -0.62 | 0.84*** |
| Positive self-statements | 3.02 (0.77) | 3.04 (0.71) | -0.34 | 0.80*** |
| Behavioural distraction | 3.08 (0.72) | 2.90 (0.90) | -2.57* | 0.79*** |
| Cognitive distraction | 2.90 (0.70) | 3.14 (0.63) | -3.46*** | 0.60*** |
| Emotion-focused avoidance | 2.45 (0.76) | 2.40 (0.79) | -0.74 | 0.86*** |
| Externalizing | 2.12 (1.04) | 2.11 (1.07) | -0.25 | 0.92*** |
| Internalizing/catastrophizing | 2.78 (0.84) | 2.73 (0.94) | -0.77 | 0.70*** |

*P < 0.05, **P < 0.01, ***P < 0.001.
everyday functioning. More research is needed to support its use in a clinical or community setting for screening a child’s pain coping strategies and parents’ perceptions of their child’s pain coping strategies.

Disclosures
The authors report no conflicts of interest.

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Appendix A. Supplemental digital content
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Table 6
Comparisons of child and parent convergence on the short-forms and long-forms of the Pain Coping Questionnaire.

|                  | Short-form | Long-form | Fisher | P    |
|------------------|------------|-----------|--------|------|
|                  | R          | R         | Z      |      |
| Approach         | 0.59**     | 0.62**    | 0.34   | 0.73 |
| Information      | 0.56**     | 0.60**    | 0.32   | 0.75 |
| Problem-solving  | 0.32**     | 0.37**    | 0.30   | 0.76 |
| Seeking social    | 0.44**     | 0.51**    | 0.45   | 0.65 |
| Problem-focused  | 0.35       | 0.49**    | 0.89   | 0.37 |
| positive         | 0.24       | 0.31      | 0.39   | 0.70 |
| statements       | 0.47**     | 0.50**    | 0.22   | 0.83 |
| Behavioural      | 0.19       | 0.35**    | 0.96   | 0.34 |
| Distraction      | 0.54**     | 0.62**    | 0.67   | 0.50 |
| Emotion-focused  | 0.59**     | 0.63**    | 0.41   | 0.68 |
| Avoidance        | 0.29       | 0.50**    | 1.36   | 0.17 |
| Information      | 0.56**     | 0.62**    | 0.67   | 0.50 |
| Externalizing    | 0.53**     | 0.63**    | 0.41   | 0.68 |
| Internalizing    | 0.29       | 0.50**    | 1.36   | 0.17 |

*P < 0.01; **P < 0.001.
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