New face on the block: A pilot study of the Faces Anxiety Scale for measuring anxiety/fear in children undergoing painful medical procedures

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Introduction:
- Both sensory (e.g., the stimulus) and emotional (e.g., fear) factors contribute to the experience of pain. Thus, children are frequently asked to report their anxiety/fear prior to, and during, painful medical procedures.
- Unlike the numerous 1-item self-report measures of pain intensity, there are limited 1-item self-report tools for anxiety/fear.
- There is no gold-standard 1-item self-report measure of anxiety/fear in children. The Children's Anxiety and Pain Scales (Kutner & LePage, 1989) is often used; however, its acceptability to children and parents is low (Chambers et al., 2005).
- The Faces Anxiety Scale (McKinley et al., 2003) was developed to measure anxiety/fear in adult patients in the intensive care unit; however, it has not been used before with children.

Objective:
- We conducted a preliminary investigation of the psychometric properties of the Faces Anxiety Scale.

Methods:
This was part of a larger study on adult reassurance during children's painful medical procedures (McMurtry, 2009; McMurtry et al., in press, Pain).

Participants:
- Phase One – venipuncture:
  - 100 children between 5 and 10 years of age (M age = 8.02; SD = 1.69) and their parents (85 mothers, 14 fathers, 1 long term female guardian).
  - Recruited from an outpatient blood lab.
- Phase Two – two weeks following venipuncture:
  - 48 children (24 boys, 24 girls) of the participants from Phase One, (M age = 7.50 years, SD = 1.41).

Measures:
- Child distress behaviors and coping behaviors during venipuncture: Child Adult Medical Procedure Interaction Scale (CAMPIS; Blount et al., 1989).
- Children's pain: Faces Pain Scale – Revised (Hicks et al., 2001).

Child Anxiety and Pain Scales
(Angel scale only)
- Original validation of the measure provided evidence of content validity and interval properties.
- Later research (not designed to assess the psychometric properties of the CAPS) has supported its convergent validity (Fowler-Kerry & Lander, 1991; Kutner & LePage, 1989).

Instructions: “Point to the face that shows how scared you felt”.

Faces Anxiety Scale
- Drawings based on facial muscle movements involved in fear.
- Greater ease of use than Visual Analogue Scale and questionnaire for adult patients in ICU.
- Evidence of rank order, interval properties, and criterion validity with adults (McKinley et al., 2003; McKinley & Madronio, 2008; McKinley et al., 2004).

Instructions: “These faces are showing different amounts of being scared. This face (left most face) is not scared at all, this face is a little bit more scared (2nd face from left), a bit more scared (sweep finger along scale), right up to the most scared possible (right-most face). Have a look at these faces and choose the one that shows how scared you were during the needle.”
- Modified from the original instructions which used “anxiety”.

Procedure:
- Faces Anxiety Scale and the CAPS were printed so that faces were equal in size.
- Phase One – immediately after venipuncture:
  - Children and parents independently completed pain and anxiety ratings.
  - Counterbalanced scale order.
  - Parents completed their ratings first: Faces Anxiety Scale and CAPS. Then children: Faces Anxiety Scale and CAPS.
- Phase Two – 2 weeks following venipuncture:
  - Same procedure as Phase One, but children and parents independently completed pain and anxiety ratings over the telephone.

Results:

Figure 1. Comparison of the response distributions for child self-report of fear using the Faces Anxiety Scale and the CAPS (anxiety).

Table 1. Comparison of the descriptive statistics for the Faces Anxiety Scale and the CAPS (anxiety scale).

<table>
<thead>
<tr>
<th></th>
<th>FAS (0-4)</th>
<th>CAPS (0-4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>1.08</td>
<td>1.01</td>
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<tr>
<td>Std Deviation</td>
<td>1.15</td>
<td>1.05</td>
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<tr>
<td>Median</td>
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<td>1.00</td>
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<tr>
<td>Range</td>
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<td>0-4</td>
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<tr>
<td>Skew</td>
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<tr>
<td>Kurtosis</td>
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<td>1.43</td>
</tr>
<tr>
<td>50th percentile</td>
<td>1.00</td>
<td>1.00</td>
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<tr>
<td>90th percentile</td>
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</tr>
<tr>
<td>95th percentile</td>
<td>3.95</td>
<td>3.95</td>
</tr>
</tbody>
</table>

Results (cont):
Reliability:
- Inter-rater: How closely did children’s and parents’ ratings match?
  - Time One: r(100) = .54, p < .001
  - Time Two: r(48) = .62, p < .001

Test-retest reliability*: How stable were the ratings over time?
- Children: r(48) = .77, p < .001
- Parents: r(48) = .73, p < .001
* Note: somewhat different than the traditional test-retest reliability as it relies on children’s memories of their fear during the venipuncture.

Validity:
- Construct: Does the Faces Anxiety Scale measure anxiety?
  - Other self-report measure of anxiety, CAPS: r(100) = .78, p < .001
  - Pain self report, FPS-R: r(100) = .60, p < .001
  - Evidence of convergent validity
  - Distress behavior, CAMPIS: r(100) = .47, p < .001
  - Evidence of convergent validity

Discussion:
- Results support the use of the Faces Anxiety Scale with children. Specifically, preliminary support was found for: inter-rater reliability, test retest reliability, convergent validity, and construct validity.
- Future research should further investigate the psychometric properties of the Faces Anxiety Scale by:
  - Asking children to order the faces (rank order properties).
  - Using the Faces Anxiety Scale compared with other scales for pain of varying intensities.
  - The preferences of raters between the available anxiety scales should be assessed.

Acknowledgements: Thank you to Sharon McKinley who provided a copy of the Faces Anxiety Scale. This research was supported by an IWK Category A Grant and Canada Research Chairs (CRC) awarded to Chambers and McGrath. McMurtry and Noel are supported by a CIHR CGS Doctoral Research Award and the CIHR Training Group Pain in Child Health.

Poster presented at the International Symposium on Pediatric Pain, Acapulco, Mexico, March 2010
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