Clinical pain research

Functional disability and depression symptoms in a paediatric persistent pain sample

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\textbf{HIGHLIGHTS}

- High rates of depression and functional disability were observed.
- Depression and functional disability had a weak association.
- PODCI may assess functional limitations independently of depression symptoms.

\textbf{ABSTRACT}

\textbf{Background and Aims:} Clinicians treating paediatric chronic pain conditions understand that persistent pain, functional ability, and symptoms of depression often co-exist, yet these relationships have only been described to a limited extent by research. This paper more closely examines the relationship between symptoms of depression and subtypes of functional disability.

\textbf{Methods:} Participants included a clinical sample of children and adolescents (\textit{N} = 239) referred to a paediatric multidisciplinary pain clinic for treatment of persistent or recurrent (chronic) pain in Australia. The majority of participants were female, (76.6\%), and were aged 7–17 years (mean age at the time of presentation was 13.8 years). Data from standardized instruments and interview data were collected from a clinical file audit. The Pediatric Outcomes Data Collection Instrument (PODCI) was used as a measure of functional difficulties performing activities of daily living, and the Children’s Depression Inventory (CDI) was used to measure depressive symptoms.

\textbf{Results:} High rates of depression and functional disability were observed, but were not associated with one another beyond relatively weak associations. Contrary to prior studies using different measures of physical functioning, depression symptoms were not associated with PODCI functional disability beyond a minor association with anhedonia symptoms (primarily driven by the pain/comfort subscale of the PODCI).

\textbf{Conclusions and Implications:} We argue that prior research has measured physical functional limitations in paediatric pain sufferers in a way that is heavily influenced by psychosocial factors, in particular by the symptoms of clinical depression. In contrast, using a measure of physical functioning (PODCI) less influenced by psychosocial factors suggests that the relationship between physical functioning during activities of daily living (e.g., use of upper limbs, basic gross and fine motor skills, basic mobility) and depression is weaker, despite both being heightened in this sample. Unlike other functional disability measures, the Pediatric Outcomes Data Collection Instrument (PODCI) may allow researchers to assess functional limitations somewhat independently of depression symptoms. This conclusion requires replication in further studies, but if confirmed, then the PODCI could be advocated as a useful measure to obtain a more ‘pure’ measure of functional difficulties due to pain, relatively independent of depression.

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1. Introduction

Chronic pain is a common and apparently growing problem in child and adolescent populations. Up to 38% of children and adolescents are affected by chronic pain and there is also evidence to suggest that these prevalence rates have risen over recent decades [1–5]. Chronic pain is more often reported by girls [2,4], seems to have onset most commonly between the ages of 12 and 14 years [2,5], and impairs children’s ability to participate optimally at home, school, sport, and during other hobbies [3–5].

According to the Pediatric Initiative on Methods, Measurement, and Pain Assessment in Clinical Trials (pedIMMPACT) taskforce (established to recommend standard measures of paediatric pain), there are three primary types of functioning likely to be impacted by chronic pain. These include role functioning (includes being a student, friend, employee, and family member), emotional functioning (mental health), and physical functioning (for example, walking or playing sports) [6]. Both depression (a type of emotional dysfunction) and other types of functional limitations have been found to occur in high rates in paediatric pain sufferers [7]. Prior research has linked global functional difficulties and emotional distress in paediatric pain samples (e.g., 8).

A common measure used in paediatric pain to measure physical functioning is the Functional Disability Inventory (FDI) [9]. The FDI assesses patients on a global functioning score, but does not produce scores for subtypes of functioning. Examining the subtypes of functioning such as physical functioning during activities of daily living (e.g., use of upper limbs, basic gross and fine motor skills, basic mobility), may help us to further understand the complexity of the relationship between different types of impaired functioning and depression. However, much, if not all, of the prior paediatric pain research has measured functional disability using global functional scores, and has not examined how subtypes of functioning interact with depression symptoms on different depression subscales. Further, measures that do include subtypes of functioning, such as the Pediatric Outcomes Data Collection Instrument (PODCI) [10], are not often used with paediatric chronic pain patients.

The purpose of this paper is to explore the inter-relationships between functional disability and depression symptoms in a sample of paediatric pain patients. In order to allow a more in-depth exploration of the relationship between depression and functional disability, this paper aims to investigate subtypes of functioning and their relationship with depression symptoms. Based on the existing literature, it is hypothesized that the depression symptoms (both globally and all subscales of depression) will be strongly and positively associated with PODCI disability (both globally and all subscales of functioning). No specific predictions beyond this were made given this is an exploratory study.

2. Material and methods

2.1. Ethics

Ethics approval was obtained from the Deakin University and Royal Children’s Hospital Human Research Ethics Committees. Patients and their parents attending the clinic signed a consent form indicating that their de-identified data may be used for research purposes in the future.

2.2. Participants

Clinical sample data were obtained by auditing the medical files of 239 children and adolescents (aged 7–17 years) who attended the Children’s Pain Management Clinic at Royal Children’s Hospital, Australia between 2002 and 2011, and who had completed the questionnaires outlined below. Of the 239 cases presenting for treatment of chronic pain, 76.6% (N = 183) were female, the mean age at the time of presentation was 13.8 years. This is consistent with the findings of previous research that adolescent girls are at greater risk for chronic pain disorders [2,4,5]. The most common presenting pain locations included lower limb pain (43.8%), head, face or mouth pain (37.2%), and lower back, lumbar spine, sacrum, or coccyx (see Table 1). These pain areas commonly present in children and adolescents, although the relative frequencies of reports may differ across individual studies [2–5]. Approximately half presented with a single pain location, a quarter with two pain areas, and the remainder 3 or more (see Table 1).

2.3. Materials

2.3.1. Demographics

Included child’s date of birth and gender.

2.3.2. Pain locations

Information on pain locations was obtained both from referral information and from a questionnaire item. The following categories were then created based on common anatomical sites in prior literature: head/mouth/neck, shoulder/upper limbs, thoracic/upper back, abdominal, lower back/sacrum/coccyx, pelvic, anal/perineal/genital, lower limb, and widespread (more than 3 major pain sites).

2.3.3. Depression symptoms

Data were collected using the Children’s Depression Inventory (CDI) [11] to assess participant’s levels of depression for the past 2 weeks. This screening tool is a 27-item self-rated symptom oriented scale suitable for children and adolescents aged 7–17 years. The CDI yields five subscales: Negative mood (irritability or anger) (reliability in current study α = .79), Interpersonal problems (difficulty making and keeping close relationships) (reliability in current study α = .47), Ineffectiveness (lack of motivation or inability to complete tasks) (reliability in current study α = .66), Anhedonia (inability or decreased ability to experience joy) (reliability in current study α = .72), and Negative Self-Esteem (belief that one is not good at anything) (reliability in current study α = .70). It is a standardized measure that incorporates specific scoring criteria in order to rate each item on a 3-point scale according to the extent to which it applies to each individual (i.e., 0 = Absence of symptom, 1 = Mild symptom, 2 = Definite symptom). The scores obtained from the five subscales are used to derive an overall indicator of depression (i.e., Total CDI), with higher scores indicating increasing severity. The scores on each item are summed to get a raw total score, which is standardized by age and gender to obtain a T-score, ranging from 34 to 100. The CDI demonstrates good validity, predicting depressive disorders and discriminating between depressive disorders and other psychological mood disorders [12,13], and has

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Paediatric pain locations (N = 239).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain location</td>
<td>N</td>
</tr>
<tr>
<td>Limb pain</td>
<td>120</td>
</tr>
<tr>
<td>Lower limb</td>
<td>105</td>
</tr>
<tr>
<td>Shoulder and upper limbs</td>
<td>30</td>
</tr>
<tr>
<td>Head, face, mouth</td>
<td>89</td>
</tr>
<tr>
<td>Lumbar region, lower back, sacrum, or coccyx</td>
<td>49</td>
</tr>
<tr>
<td>Abdominal region</td>
<td>33</td>
</tr>
<tr>
<td>Thoracic region, upper back</td>
<td>20</td>
</tr>
<tr>
<td>Widespread (more than 3 major sites)</td>
<td>20</td>
</tr>
<tr>
<td>Pelvic region</td>
<td>17</td>
</tr>
<tr>
<td>Cervical region, neck</td>
<td>13</td>
</tr>
<tr>
<td>Anal, perineal, and genital region</td>
<td>2</td>
</tr>
</tbody>
</table>

Note: Cumulative percentages exceed 100% due to multiple diagnoses per patient.
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