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Topical review

Worry and catastrophizing about pain in youth: A reappraisal

Christopher Eccleston [a,*], Emma Alice Fisher [a], Tine Vervoort [b], Geert Crombez [b]

[a] Centre for Pain Research, University of Bath, Bath, UK
[b] Department of Experimental – Clinical and Health Psychology, Ghent University, Ghent, Belgium

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1. Introduction

Catastrophizing about pain is defined as "an exaggerated negative 'mental set' brought to bear during actual or anticipated pain experience" [25]. It is a salient form of worry, and one that has proven useful in explaining pain severity, disability, and adaptation to treatment in a range of different conditions and settings [7,12]. Catastrophizing involves repeated thought about threat as uncontrollable and likely to have awful consequences. These aspects have been captured neatly by Sullivan and colleagues with the labels of "rumination," "helplessness," and "magnification" [24].

Catastrophizing was identified as important for children's adaptation to pain and included in early measurement tools focused on coping [20]. However, interest has been fuelled by the development of the child version of the adult Pain Catastrophizing Scale, the PCS-C [3,27,29]. We suggest that a reappraisal of catastrophic thinking about pain in young people is needed before research blooms. In what follows, we focus on a developmental view of emotional coping, we look again at how catastrophizing about pain has been researched with children, and we suggest an alternative view. Finally, we introduce the research and clinical implications of this reappraisal.

2. Social-cognitive development

Children and young people perceive the world, how it affects them, and how they can act on the world, in fundamentally different ways from adults [32]. Specifically, children emotionally appraise threat, its potential consequences, and how to cope, differently. Relevant to this reappraisal are 4 key social-cognitive features of development in youth.

2.1. Emotional control

A primary developmental task of childhood is the mastery of emotional responses to events, in particular the ability to control aggressive, depressive, and anxious emotions. Socially unacceptable strong behavioural reactions (eg, tantrum) are common causes of parental intervention. Similarly, parental emotion-management strategies are critical determinants of young children's emotional development [1,8]. Indeed, children under 11 years of age regularly magnify the negative consequences of what, to an adult's understanding, is a neutral, relatively unthreatening, occurrence (eg, being told "no").

2.2. Magical thinking

Children have different beliefs from adults about what is real. Some are socially sanctioned (eg, the tooth fairy), others emerge and are expressed as childhood anxieties. For example, common childhood fears across cultures and ages include monsters, the dark, and burglars [9]. Maturation brings a shift from beliefs judged by adults to be childish (eg, monsters) to magical beliefs more socially acceptable to adults (eg, superstitions). Distracting fears persist into late adolescence [18], but before reaching adulthood, children over 12 years of age increasingly develop the ability to think about their own beliefs, reflect on the veracity of those beliefs, and discuss alternatives [19]. Part of being a child is the ability to hold and manage what, to adults, appear to be irrational fears.

2.3. Egocentric distortion

A major task of child development is the tempering of egocentrism, including a raised awareness of personal vulnerability and the development of allocentrism (the ability to see the world from another's point of view). After 11 years of age, most young people are cognitively capable of allocentric reasoning, although egocentrism extends well into adolescence [22]. Indeed, egocentric distortion is common in adults (see, for example, the self-serving attribution bias [21]), but for healthy children, overestimating personal agency is normal [19,32]. Young children also commonly believe that their wishes, wants, and hopes are powerful causes of events [30,33]. A defining feature of childhood is an attitudinal set that prioritizes one's own view of the world.

2.4. Fragile coping

Cognitive development brings the ability to imagine future events and the possible negative consequences of those events. Po-

* Corresponding author. Address: Centre for Pain Research, University of Bath, Bath BA2 7AY, UK. Tel.: +44 12253686439; fax: +44 1225386113.
E-mail address: c.eccleston@bath.ac.uk (C. Eccleston).

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tential sources of threat and the resources to cope with these threats increase. Children have less experience than adults in emotional coping, and fewer problem-solving skills [2]. Younger children typically inhabit a world in which powerful adults act to solve problems. Adolescent social development can be defined as a period of behavioural experiment when novel and often fragile coping attempts emerge. For children, being dependent and being helped to cope with threat is the socially desirable norm.

Young people differ fundamentally from adults in what they fear, how they experience it, and how they attempt to cope. In summary, normal children have irrational fears, magnify the awful consequences of those fears, are habitually egocentric, have little experience in emotional and social coping, and are used to being helped.

3. Catastrophic thinking and worry about pain

Catastrophic thinking in adults is defined by magnification (eg, "this is really serious"), rumination (eg, "I can't keep it out of my mind"), and helplessness (eg, "I can do nothing") [24]. Although this approach is valid for understanding adults with chronic pain, applying this scheme to young people risks judging perfectly normal developmentally appropriate behaviour to be abnormal. In particular, it may be normal for young people to think of painful events as serious, to think about wanting them to stop, and to feel helpless to change them.

On adopting this perspective, we took the empirical opportunity to look critically at some of our own work. Taking 4 samples of children who completed the PCS-C from different studies, 2 of schoolchildren without chronic pain, and 2 from clinical samples of children with chronic pain, we explored in more detail the pattern of item endorsement. Full details of the samples are available in the individual publications, but samples include 912 schoolchildren [26], a further 1332 schoolchildren [28], 43 adolescent chronic pain patients [29], and 61 adolescent patients with painful arthritis [26]. The PCS-C is a 13-item questionnaire that is almost identical to the PCS in content, but the reporting format has been simplified. It has 6 "helplessness" items, 4 "rumination" items, and 3 "magnification" items. The mean strength of endorsement for all items in a total sample (n = 2348) on a 1-5 point scale was 1.21 (SD = 1.08), demonstrating that these cognitions are not particularly strong or frequent; although greater for the clinical samples (M = 1.47, SD = 1.22) than nonclinical (M = 0.94, SD = 0.94). The most highly endorsed items were "When I am in pain I want it to go away," followed by "When I am in pain I keep thinking about how much I want it to stop," reflecting a ruminative or worrying aspect to the experience. Given the low strength of endorsement of most of these items in numerous samples, and the primacy of rumination, we consider it likely that the PCS-C does not have content entirely relevant to child catastrophizing. The PCS-C may be better understood as an index of worry about pain rather than of catastrophic beliefs [4].

Worry is prevalent in youth and develops extensively in early adolescence [13,16]. The content of worry is different from that of adults. Children worry about separation, abandonment, and attack from unknown sources. Adolescent worries are dominated largely by the fear of adult disapproval, social rejection, appearance, and task failure. Secondary worries have been described: of poor health in others, family conflict, environmental disaster, harm to pets, and of monsters [23,15,17]. Unfortunately, we know little about worry in the context of paediatric chronic pain as it has never, to our knowledge, been directly investigated. For adults, worry is experienced as aversive, it maintains a focus on a problem and its negative consequences if unsolved, and it is thought to promote attempts at problem-solving. Catastrophizing can usefully be thought of as extreme worry, with specific content about the consequences of a salient threat [4]. For children, however, we do not know what form worry about pain takes, and how it functions in relation to coping.

4. Research implications

This reappraisal promotes a developmental view of children's emotional coping with pain. It foregrounds a number of important research domains.

4.1. Assessment

Measurement tools of catastrophic thinking have been useful in some settings but almost certainly lack content validity [3,20], offering at best only a partial sampling of child catastrophic thinking. Perhaps the strategy of adapting successful adult measures, as we did with the PCS-C, should be seen as only a first step. Needed are new measures of internalizing coping that begin with a child normative view of anxious thinking, explain child verbal behaviour as a function of cognitive and emotional development, and that are sensitive to the immediate social context of pain, such as adult helping.

4.2. Worry

Second, we encourage the investigation of worry about pain and its consequences in young people. We have no data on what young people in pain worry about, the way in which they worry about it, and the functions of worry in promoting coping attempts from self or powerful others. Similarly, we have little understanding of the consequences of chronic worry about pain on social and emotional functioning in later life.

4.3. Catastrophic thinking

Third, catastrophic thinking about pain may have a specific role to play in the development of child coping skills. However, fear about the potentially uncontrollable consequences of pain is likely to be found in developmentally relevant domains. For a figurative example, it is more likely that young people ruminate about the devastating effects of pain on appearance and relationships than on the ability to financially support dependents [11].

4.4. Individual differences

Finally, our consideration of worry and catastrophizing has not addressed individual differences such as age, sex, temperament, and parenting. Age differences in worry are well documented. For example, younger children reported higher levels of worry about disasters than older children [23]. Four- to six-year-olds were found to worry most about separation from parents. Older children are concerned with personal harm or harm to others, and at age 10 years, concerns about test performance emerge and begin to dominate [16]. Sex differences should also be investigated, as girls worry more about academic and social competence [23]. Similarly, parenting is of critical importance in the adoption of pain-coping strategies and should be investigated [31].

5. Clinical implications

Promising psychological treatments for the management of chronic pain in children have been developed [5]. These treatments have content aimed at helping young people identify dysfunctional

cognition and adopt strategies for improved problem-solving. This reappraisal suggests that the treatment literature can be improved with a focus on 3 specific areas.

5.1. Addressing child worry

Understanding worry about chronic pain will allow for treatments that either reduce uncertainty or improve tolerance for uncertain imagined outcomes. Wherever possible, abstract reasoning should be replaced by direct experience and behavioural experiment. Attempts to reassure by denying feared outcomes and generalizing are likely to be ineffective (eg, "don't worry, it will be alright"), because these fears will be contingent on age-dependent social norms, and have specific targets [14].

5.2. Coping skills training

Recognizing the nascent coping repertoire and unstable emotional control will be important. Needed are problem-solving interventions that are tailored to the specific problems and concerns identified as being caused by pain. We have found, for example, that adolescents with chronic pain are delayed in their development of independence and relationship confidence [6]. An increased focus on the goals of adolescence interrupted by pain may be fruitful.

5.3. Public health

In addition to direct psychotherapeutic interventions, the role for community-based interventions should be considered. Pain is a common childhood experience that can lead to altered self-perception and anxious searching for relief, including the risk of an increase in the use of illicit drugs and alcohol. Children search for pain-related information that is rarely provided outside of specialist contexts [10]. There is a role for enriched personal care training for young people that specifically addresses common fears and anxieties about pain and its consequences.

5.4. Conclusions

Young people think in very different ways than adults. Research into catastrophic thinking and worry in children's pain can be enriched by a reappraisal of the social and developmental context of cognition about threatening events. Research could usefully be refocused on worry about pain and its consequences, and treatment could be improved with an understanding of child fears and what sustains them, and the development of specific interventions that account for these fears.

Conflict of interest statement

None of the authors have any conflicts of interest related to this topical review.

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