

Body in Mind

Poor functional outcomes in pediatric chronic pain – what’s catastrophizing got to do with it?

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Catastrophizing has long been implicated in many poor outcomes in chronic pain-related conditions in both adults and children [3,4,11,12,14,15,18,20,22,24,29]. Scholars have called for interventions to reduce catastrophizing in children with chronic pain with the hope of improving outcomes [1,16,36]. However, important unanswered questions remain such as: How strong and how consistent are the associations between catastrophizing, pain, and various functional outcomes? Finding answers to these questions may provide critical information that will optimize the distribution of limited clinical and financial resources to those likely to benefit.

We sought answers to these questions by systematically integrating and meta-analyzing existing studies that examined the relationships between catastrophizing, pain, and functional outcomes in pediatric pain. Included studies, published by March 27th, 2017, were identified in PsychInfo, MEDLINE, PubMed, and Embase. A total of 111 effect sizes from 28 cross-sectional studies were included to assess the strength and consistency of the relationship, prior to intervention, between pain catastrophizing and the following: 1) pain intensity, 2) physical functioning, 3) anxiety, 4) depression, and 5) quality of life. Additionally, sex (i.e., percentage of the sample that was female), average pain duration, pain diagnosis, and pain catastrophizing measures were investigated as moderators of the relationship between catastrophizing and pain and functional outcomes.

Our two primary findings were: 1) catastrophizing demonstrated a strong relationship with anxiety, depression, and quality of life, and 2) catastrophizing demonstrated a moderate relationship with physical functioning and pain intensity. All examined relationships were robust against publication bias and study quality variation. Additionally, sample sex, average pain duration, pain diagnosis, and pain catastrophizing measure did not function as moderators of the relationship between catastrophizing, pain, and functional outcomes [21].

Anxiety and depression demonstrated the strongest associations with catastrophizing. Individuals who catastrophize about their pain may be more likely to have general (i.e., not pain-specific) maladaptive thinking styles, thereby catastrophizing about non-pain specific situations. Previous studies show that maladaptive thinking styles are common among individuals with anxiety and depression [5,10,30]. The strong association may also be due to conceptual overlap among catastrophizing, anxiety, and depression. Based on the strong association between catastrophizing, anxiety and depression, it makes intuitive sense that improving catastrophic thinking about pain would alleviate anxiety and depressive symptoms. However, this reasoning has not been supported by evidence – specifically, changes in catastrophizing do not explain changes in depression symptoms

following psychological treatment [17,35]. The mechanism by which catastrophizing is closely linked to anxiety and depression levels is yet to be revealed.

Catastrophizing was moderately related to physical functioning in our study. The fear-avoidance model provides one way to make sense of this finding [2,25,28]. In this model, catastrophizing about pain leads to fear of future pain, which then leads to activity avoidance aimed at preventing further pain. Ultimately, this cycle is thought to result in deconditioning of the body and a consequent self-perpetuating feedback loop [28]. The biopsychomotor model provides an alternative way to make sense of this finding [31]. The protective and social-relational aspects of this model seem particularly relevant. Children who catastrophize about their pain may demonstrate more protective pain behaviors (e.g., guarding and bracing); these behaviors have been linked to decreased physical functioning [32]. Additionally, these protective pain behaviors may elicit solicitous responses (“You look like you are hurting. Take it easy”) from parents, teachers, and peers, which reinforce physical disuse and subsequently worsen functional disability.

Quality of life, most commonly measured with the PedsQL, demonstrated a strong relationship with catastrophizing. One explanation for this strong association is the overlap between the domains (i.e., physical, emotional, social, and school domains) the PedsQL covers and our other outcomes of interest (i.e., physical functioning, anxiety, and depression) [33]. However, what remains to be determined is how much of the strong association between catastrophizing and quality of life is specific to social or school functioning – although children with chronic pain often report deficits in these domains, they have received much less attention in the literature [9,23].

Surprisingly, catastrophizing and pain intensity had the weakest relationship compared to other outcomes. While studies have posited both physiological and neural explanations for the association between catastrophizing and pain, most have included only adults [6,13,26,27]. However, the results of a recent study in children with pediatric complex regional pain syndrome suggest that pain catastrophizing may predispose children and adolescents to develop chronic pain, experience greater pain intensity when they do have pain, and engage in particular behavioral and emotional responses to that pain [7]. While contrary to the current findings, the strength of the relationship between catastrophizing and pain intensity may vary across pain diagnoses. In the current study, pain diagnosis was evaluated as a moderator of these relationships. However, sample sizes within each pain diagnosis were small.

Take-home message: catastrophizing has consistent and strong-to-moderate associations with poor functional outcomes in children with chronic pain. Cognitive-behavioral, relaxation, and acceptance-based interventions have demonstrated small effects in reducing pain catastrophizing in children [8,19,34]. Our meta-analytic results provide additional support for their use. Furthermore, our results suggest these interventions may lead to particular improvements in anxiety, depression, and overall QOL. Several important questions remain for future research – among them: 1) how long do these treatment effects last, and 2) what are their underlying mechanisms of action. Answers to

these questions would provide insights for the further refinement of existing treatments and the formulation of new treatments to target catastrophic thinking and improve the function of children with pain.

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