American Pain Society
RESEARCH
EDUCATION
TREATMENT
ADVOCACY
PUBLISHED BY ELSEVIER

The Journal of Pain, Vol ■■, No ■■ (■■), 2017: pp ■■-■■
Available online at www.jpain.org and www.sciencedirect.com

Original Report

Unravelling the Relationship Between Parent and Child PTSD and Pediatric Chronic Pain: the Mediating Role of Pain Catastrophizing

Alexandra Neville, Sabine Soltani, Maria Pavlova, and Melanie Noel
Department of Psychology, University of Calgary and Alberta Children's Hospital Research Institute, Calgary, Alberta, Canada.

Abstract: **Clinically elevated rates of post-traumatic stress disorder (PTSD) symptoms are found among many youth with chronic pain and their parents and are linked to worse child pain outcomes. Conceptual models of mutual maintenance in pediatric PTSD and chronic pain posit that child and parent pain catastrophizing are key mechanisms underlying this co-occurrence. To our knowledge, the current study is the first to examine child and parent pain catastrophizing as potential mediators in the child PTSD-child pain and parent PTSD-child pain relationships among a cohort of youth with chronic pain. One hundred two children (72.5% female, mean age = 13.5 years), recruited from a tertiary level chronic pain program, and 1 of their parents participated. At intake, parents completed psychometrically sound self-report measures of PTSD symptoms and catastrophizing about child pain. Children completed self-report measures of PTSD symptoms, pain catastrophizing, pain interference, and pain intensity. Findings revealed that relationships between child PTSD and child pain as well as parent PTSD and child pain were mediated by child (but not parent) pain catastrophizing. This suggests that children's catastrophic thinking about pain may explain how child and parent PTSD symptoms influence children's experience of chronic pain and is a potential target in family-based interventions to improve pain and mental health outcomes.**

Perspective: ***Consistent with conceptual models of co-occurring PTSD and chronic pain, children's catastrophic thinking about child pain mediated relationships between parent and child PTSD symptoms and child chronic pain outcomes. Child pain catastrophizing may be a fruitful target in interventions to improve children's chronic pain and mental health outcomes.***

Key words: *Pain, catastrophizing, post-traumatic stress disorder, children, parents.*

Pediatric chronic pain is prevalent among youth,[34] associated with high economic burden,[27] and has a profound effect on the entire family.[44,45] Chronic pain has been shown to be highly comorbid with post-traumatic stress disorder (PTSD) in adults[3,7,43] and recently this co-occurrence has been investigated in youth.[42] Exposure to early life trauma[13] has been associated with the development of pain-related conditions later in life[50,52] and recent epidemiological evidence suggests that adolescent chronic pain is linked to greater risk for lifetime diagnoses of anxiety disorders (including PTSD) reported in adulthood.[40]

Clinically elevated PTSD symptoms have been reported among youth with chronic pain (32%) and their parents (20%) compared with pain-free peers (8%) and their parents (1%).[42] Among youth with chronic pain, higher levels of PTSD symptoms were related to higher pain intensity and pain interference.[42] Similarly, among youth with chronic pain, higher levels of parent PTSD symptoms were related to higher child-reported pain intensity.[42] It has been posited that these PTSD-pain relationships are influenced by parent and child cognitions

Received May 20, 2017; Revised October 7, 2017; Accepted October 17, 2017.
This work was supported by funding awarded to Melanie Noel by the Vi Riddell Pediatric Pain Initiative and the Alberta Children's Hospital Research Institute.
The authors have no conflicts of interest to declare.
Address reprint requests to Alexandra Neville, BA, Department of Psychology, University of Calgary and Alberta Children's Hospital Research Institute, 2500 University Drive NW, Calgary, AB T2N 1N4, Canada. E-mail: alexandra.neville@ucalgary.ca
1526-5900/$36.00

https://doi.org/10.1016/j.jpain.2017.10.004

(eg, pain catastrophizing); however, empirical research has not yet examined specific mechanisms underlying the relationships between parent and child PTSD symptoms and child chronic pain that may explain why this co-occurrence exists.

Two recently proposed conceptual frameworks highlight factors that may underlie the co-occurrence of PTSD and chronic pain symptoms in youth, including cognitive processes and parent influences.[30,37] Specifically, child and parent pain catastrophizing were proposed as individual and interpersonal mechanisms through which child and parent PTSD symptoms may influence children's chronic pain outcomes.[30] Child and parent pain catastrophizing (ie, the tendency to magnify and ruminate about the threat value, and feel helpless in the face, of child pain) are robust predictors of worse child pain outcomes,[15,26,59] and are closely tied to each other.[36] Pain catastrophizing may underlie the PTSD-pain relationship due to amplification of threat appraisals and fueling of avoidance. Excessive negative appraisals of a traumatic event and/or its sequelae have been implicated in cognitive models of persistent PTSD, such that they may produce a sense of current threat and lead to maladaptive cognitive processing, such as selective attention to threat and rumination.[20] PTSD symptoms of hyperarousal, hypervigilance, and exaggerated negative beliefs may also exacerbate pain symptoms by focusing attention on threatening appraisals (ie, rumination and magnification) of the pain, and increasing feelings of helplessness.

Re-experiencing symptoms and intrusive thoughts, hallmark symptoms of PTSD, and catastrophic thinking also demand cognitive resources that may reduce one's ability to engage in adaptive coping with pain.[54] For example, child PTSD symptoms may influence parent catastrophic thinking about child pain, through observable behaviors that indicate the child's distress, hypervigilance, fear, and avoidance. Moreover, parents' own PTSD symptoms may lead them to interpret their child's pain symptoms as threatening (influencing parent catastrophizing), which could manifest in their affective and behavioral responses to their child's pain (influencing child catastrophizing). This could manifest through parental behavioral responses (eg, protectiveness) that draw children's attention to symptoms and amplify children's catastrophic thinking about pain.[17]

Despite being posited as mechanisms underlying the relationship between PTSD symptoms and child chronic pain outcomes, research has not yet examined the role of child and parent pain catastrophizing in this co-occurrence. To our knowledge, this study is the first to examine the roles of children's and parents' catastrophic thinking about child pain in the relationships between child and parent PTSD symptoms and children's chronic pain symptoms among a cohort of youth with chronic pain. Consistent with the recently proposed pediatric model of co-occurring PTSD and chronic pain,[30] we hypothesized that 1) higher levels of child and parent PTSD symptoms would be associated with increased child pain intensity and interference, and 2) the relationships between child PTSD and child pain as well as parent PTSD and child pain would be mediated by child as well as parent pain catastrophizing.

Methods

Participants and Setting

One hundred eighty-two child-parent dyads were invited to participate in the current study. Of those, 19 declined participation. One hundred two child-parent dyads completed at least 80% of each questionnaire and were included in analyses. Youth and one of their parents were invited to participate either via telephone or e-mail as part of their initial orientation to a tertiary level chronic pain program, before receiving treatment. Youth were eligible if they were between 8 and 18 years of age and were referred to a chronic pain program for pain assessment and/or treatment. Youth and parents who did not speak English and/or were diagnosed with a developmental disorder were excluded from the study.

Data from 102 children and adolescents (72.5% female, mean age = 13.5 years [SD = 4.2], range = 8–18 years) and their parents (93.1% mothers) were included in the analyses. Youth were enrolled in abdominal pain (.9%), complex pain (42.2%), or headache (56.9%) clinics. Sociodemographic information (ie, sex, age, ethnicity, household annual income) are presented in Table 1. Descriptive statistics for parent and child variables are shown in Table 2. Nearly three-quarters (71.6%) of the youth in the sample reported pain in multiple locations and 28.4% of youth reported pain in 1 location (58.6% reported headache, 10.3% reported abdominal pain). The average pain intensity level in the past week was 5.5 of 10 (SD = 2.1). On average, youth reported pain duration of 3.0 years (SD = 2.8); 38.2% of youth reported pain as being "always

Table 1. Sociodemographic Characteristics of the Sample (N = 102)

Sociodemographic Characteristic	*Value*
Child's mean age (SD), years	13.5 (4.2)
Child's sex (% female)	72.5
Parent's sex (% female)	93.1
Relationship to the child (%)	
Biological parent	98.0
Adoptive parent	2.0
Child's ethnicity (%)	
White (Caucasian)	78.2
Two or more ethnicities	9.9
Latin American	5.0
Arab/West Asian	3.0
Other	3.0
Do not want to answer	1.0
Household income, %	
<$10,000 to $29,999	6.1
$30,000 to $59,999	11.2
$60,000 to $89,999	11.2
More than $90,000	52.0
Do not want to answer	19.4
Mean school days missed in the past 3 months (SD)	7.6 (9.6)