Original Article

Pain Catastrophizing, rather than Vital Signs, Associated with Pain Intensity in Patients Presenting to the Emergency Department for Pain

Phoebe R. Block, MA,[*] Beverly E. Thorn, PhD, ABPP,[*] Shweta Kapoor, MBBS, PhD,[†] and Jessica White, BA[‡]

Abstract:

This study examined the relationships of self-reported pain intensity with vital signs, pain catastrophizing, and state anxiety in patients presenting to the emergency department (ED) for acute pain, exacerbations of chronic pain, or acute pain with concurrent chronic (combined) pain, comparing the pattern of relationships among these three pain groups. One hundred fifty-eight patients presenting to the ED for pain were recruited. Vital signs and self-reported pain intensity were obtained at triage, then participants completed self-report measures of pain catastrophizing, state anxiety, and demographic information. No significant associations were found between vital signs and pain intensity at triage in any of the pain groups. Pain catastrophizing was significantly associated with self-reported pain intensity in the acute pain group ($r = .34$, $p < .05$) and combined pain group ($r = .30$, $p < .05$), and state anxiety was significantly associated with self-reported pain intensity in with the acute pain group ($r = .27$, $p < .05$). When pain catastrophizing and state anxiety were used in a stepwise multiple regression analysis to predict self-reported pain intensity in the acute pain group, only pain catastrophizing emerged as a unique predictor ($\beta = .405$, $p < .01$). Consistent with previous research, vital signs were not associated with self-reported pain intensity in patients presenting to the ED for pain, including those with chronic pain. Given the significant association of pain catastrophizing and pain intensity among patients presenting to the ED for acute pain, brief measurement of pain catastrophizing may inform pain treatment in the ED.

*From the *Department of Psychology, University of Alabama, Tuscaloosa, AL; †The Department of Psychiatry and Behavioral Sciences, Emory University School of Medicine, Atlanta, GA; ‡The Alabama College of Osteopathic Medicine, Dothan, AL.*

Address correspondence to Phoebe R. Block, MA, Department of Psychology, The University of Alabama, Box 870348, Tuscaloosa, AL 35487-0348. E-mail: pblock@crimson.ua.edu

Received November 4, 2015; Revised September 18, 2016; Accepted December 8, 2016.

The authors do not have any financial disclosures or any conflicts of interest to disclose in relation to this study. All procedures, including the informed consent process, were conducted in accordance with the ethical standards of the responsible committee on human experimentation (institutional).

1524-9042/$36.00

http://dx.doi.org/10.1016/j.pmn.2016.12.001

Pain is the most common cause for visits to the emergency department (ED) (Tanabe & Buschmann, 1999; Todd et al., 2007). Individuals present to the ED for acute pain or exacerbations of chronic pain. Acute pain refers to the "normal, expected physiological response to a painful stimulus, an adverse chemical, thermal or mechanical stimulus… associated with surgery, trauma and acute illness" and is time limited, ending when the tissue has healed (Federation of State Medical Boards of the United States, 1998).

Chronic pain, however, is ongoing, persistent pain, lasting more than 3-6 months that is not associated with an acute injury or illness (American Chronic Pain Association, 2016). The prevalence of moderate to severe pain in individuals presenting to the ED is estimated to be at least 20% (McLean, Maio, & Domeier, 2002). Despite the high prevalence of presenting complaints associated with significant pain in the ED, oligoanalgesia remains a challenge with many patients still experiencing substantial pain at discharge (Tanabe & Buschmann, 1999; Todd et al., 2007). Thus, in order to enhance quality of care in the ED and other health care settings, pain, both acute and chronic, must be better understood.

While pain is a subjective experience influenced by a multitude of factors, vital signs have been used to validate patients' self-reported pain intensity (Bendall, Simpson, & Middleton, 2011; Marco, Plewa, Buderer, Hymel, & Cooper, 2006; Tousignant-Laflamme, Rainville, & Marchand, 2005). However, previous research examining acute pain experience has failed to find clinically significant associations between self-reported pain intensity and vital signs in the ED and prehospital settings (Marco et al., 2006; Bossart, Fosnocht, & Swanson, 2007; Lord & Woollard, 2011).

No research has specifically focused on the relationship between vital signs and self-reported pain intensity in individuals experiencing exacerbations of chronic or recurrent pain; specifically, previous research excluded patients with "nonverifiable pain syndromes" (i.e., chronic pain conditions) (Marco et al., 2006). Existing literature suggests the association between pain and cardiovascular regulatory systems differs between those with acute pain and those with chronic pain (Bruehl & Chung, 2004). Consequently, the exclusion of individuals with chronic pain from past research is problematic given that approximately half of all patients with pain in the ED present with exacerbations of chronic or recurrent pain (Neighbor, Puntillo, Homel, & Knox, 2007).

However, there is a large body of evidence that supports the importance of psychological factors on pain experience, pain response, and pain treatment (Turk & Okifuji, 2002). Pain catastrophizing is an influential variable in relation to pain outcomes, for example, acute and chronic pain severity (Quartana, Campbell, & Edwards, 2009). Pain catastrophizing is traditionally defined as maladaptive, negative cognitions, or emotions in response to thoughts and feelings about actual or anticipated pain, for example, feeling helpless to cope with pain (Sullivan et al., 2001).

Higher levels of pain catastrophizing are associated with higher self-reported pain intensity in a variety of pain conditions and across a variety of clinical settings (Edwards, Bingham, Bathon, & Haythornthwaite, 2006; Granot & Ferber, 2005; Severeijns, Vlaeyen, van den Hout, & Weber, 2001; Sullivan et al., 2001). One study found pain catastrophizing to be a significant predictor of postoperative pain among 48 individuals undergoing anterior cruciate ligament repair. Participants reporting high levels of pain catastrophizing before surgery reported higher pain intensity and more pain disability (i.e., pain when walking) compared to those reporting lower levels of pain catastrophizing before surgery (Pavlin et al., 2005).

Anxiety is also a significant predictor of pain treatment outcomes. Patients presenting to the ED for pain with higher levels of anxiety report higher levels of pain and are more likely to request pain medication (Craven, Cinar, & Madsen, 2013). Furthermore, pain catastrophizing mediates the relationship between pain intensity and state anxiety in patients presenting to the ED with acute pain and no previous history of persistent pain (Kapoor, White, Thorn, & Block, 2016). Despite these findings, neither pain catastrophizing nor state anxiety is routinely assessed in the ED.

The present study examined the relationships among self-reported pain intensity, vital signs, pain catastrophizing, and state anxiety in patients presenting to the ED for acute pain, exacerbations of chronic pain, and acute pain with concurrent, unrelated chronic pain. Both pain catastrophizing and state anxiety were hypothesized to be better predictors of pain intensity than vital signs. Finally, exploratory analyses were conducted to examine and identify any differences in the relationship between pain intensity, vital signs, and psychological factors in individuals presenting to the ED with acute pain, exacerbations of chronic pain, or acute pain with concurrent chronic pain.

METHODS

Design, Participants, and Procedures

In this cross-sectional study, a convenience sample of 158 adults was recruited from an urban ED in the