



Psychosocial factors and their influence on the experience of pain

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Abstract

Over the past 20 years, our understanding of social factors on pain experience has increased. Edwards et al observed that the presence of a friend resulted in an increased pain threshold and tolerance to experimentally induced pain (cold pressor test and pressure algometry). Having a male friend present had the most prominent effect on male participants' reporting of pain. However, the effects of psychosocial traits known to effect pain experience (eg, catastrophising) were not considered.

Keywords: Pain, Social, Friend, Catastrophising

Commentary on: Edwards R, Eccleston C, Keogh E. Observer influences on pain: an experimental series examining same-sex and opposite-sex friends, strangers, and romantic partners. PAIN 2017;158:846–55.

Response article: Edwards R, Eccleston C, Keogh E. Psychosocial factors and their influence on the experience of pain: response to commentary. PAIN Reports 2017:e607.

Pain is a dichotomous phenomenon. A true double-edged sword, it can protect us from injury in the short term, but can also be severely disabling if it becomes chronic. The way in which we have defined pain has evolved with our increased understanding of its underlying psychophysiological mechanisms. A recent proposal from de Williams and Craig defines pain as “a distressing experience associated with actual or potential tissue damage with sensory, emotional, cognitive, and social components”.⁴ This proposed update to the definition of pain has, as the authors intended, resulted in debate and discussion in an attempt to lead to an improved definition of pain [Ref. 4 and associated commentaries].

Current debate aside, the recently proposed definition of pain highlights the increasing recognition and acceptance of the *biopsychosocial model of pain*. After first being proposed by Engel in 1977, and subsequently being applied to pain, the

biopsychosocial model of pain is considered to be the most comprehensive theoretical perspective of pain¹⁵ as it accounts for contributions of psychological, biological, cognitive, affective, behavioural, and social factors in the variability in the conscious experience, and clinical presentation of pain between individuals.

The increase in acknowledgement and application of the biopsychosocial model (in pain research) is the result of a growing body of literature indicating a key role of social factors, including social support, in modulating the experience of pain in both clinical [eg, reduced analgesic medication use and reports of less pain during childbirth⁸; and experimental [eg, reports of lower levels of pain after application of noxious experimental stimuli²; settings. However, much remains unknown about how the relative impact of male–female social interaction and support can modulate the experience of pain.

Three recent experiments by Edwards et al⁶ provide new insight into the role of dyadic social relationships to modulate the communication of pain, particularly in relation to status and sex differences in dyad pairings. In these experiments, otherwise healthy, pain-free participants were exposed to experimentally induced painful stimuli (cold pressor test and pressure algometry) in within-subjects design paradigms while they were alone, and while being observed by either a friend or a stranger (n = 48 dyads; study 1), a same- or opposite-sex friend (n = 48 dyads; study 2), or an opposite-sex friend or opposite-sex romantic partner (n = 48 dyads; study 3).

The presence of another person during the experimental pain tasks resulted in an increase in both pain threshold (ie, resulting in a higher point at which the participant first perceived the stimulus to be painful) and pain tolerance (ie, the point at which the participant could no longer tolerate the noxious stimulus) for both

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the cold pressor test and pressure algometry, compared with when the participant completed the tasks alone. Although these findings are in line with some previous findings,¹¹ many studies do not observe this social buffering effect on pain.¹⁰ Furthermore, there was no effect of social support on subjective pain intensity ratings of the experimentally induced stimuli on a 101-point visual analogue scale. Therefore, the results of the experiments by Edwards et al suggest that only the *reporting* of pain was modulated by the presence of another person, rather than pain *perception* per se. Following on from this point, the experiments by Edwards et al could therefore have been improved if they had used additional objective measures of pain response. For example, the skin conductance response has been found to vary in accordance with noxious stimulus intensity [for a detailed review, Ref. 12]. The inclusion of an objective measure would have allowed the authors to examine if both the perception and reporting of pain were modulated by social factors. However, there are many challenges associated with identifying and using objective measures of pain.³

The experiments by Edwards et al also found that the sex of the observer affected the experience of pain, but only when the observer was a friend, as opposed to a stranger. The increase in pain tolerance was most pronounced for male–male dyads, compared with male–female, female–male, or female–female dyads. The authors concluded that these findings reflected stereotypical male behaviour patterns, whereby men typically behave with greater stoicism and are less likely to express specific emotions that may indicate weakness or vulnerability (ie, pain) in order to be viewed in a favourable manner by their peers. In contrast, same-sex female friends may be more willing to communicate their experience of pain, as these friendships typically involve higher levels of open, positive social support and intimacy.⁵ The authors should be commended for their interesting work in these experiments. It should be noted, however, that numerous other psychosocial factors (eg, trait characteristics including catastrophising, the fear of pain, and empathy) need to be considered, as these factors may have contributed to the observed effects and play an important role in the ability for social support to modulate pain communication and experience.

Pain catastrophising can be defined as “an exaggerated negative mental set brought to bear during actual or anticipated painful experience.” Individuals with high catastrophising are more sensitive to visceral thermal and mechanical stimulation and report more intense pain after the cold pressor test, compared with those who do not catastrophise.¹³ Increased fear of pain is also associated with higher levels of self-reported experimentally induced pain intensity.⁷ Given that catastrophising and the fear of pain exert a large impact on pain experience, future studies examining social impacts on pain should consider controlling for such traits. We might expect to see that persons with a tendency to catastrophise, or who have high fear of pain, may be more susceptible to the effects of social support on pain experience, with larger increases in pain tolerance and pain threshold (ie, reduced reporting of pain) when a friend is present. Alternatively, individuals with high levels of catastrophising may display increased sensitivity to pain and communicate about their pain more when a friend or family member is present.¹

In all the 3 experiments, cold pressor pain tolerance was higher when the friend or romantic partner was present in the room as an observer, but also when participant completed the experiment alone while the friend was in the next room. The authors suggest that simply knowing that a friend was nearby while enduring pain may be sufficient to affect pain experience. These effects may be explained by the multidimensional social process of empathy, which plays a critical role in eliciting compassionate behaviours to

alleviate the distress of others. If so, it raises an interesting question about whether the “analgesic” effects of social support are enhanced if the observer is perceived as more empathic, or their relationship is more intimate, questions that are only partly identified by the authors.

Previous research has found that females, compared with males, have higher trait empathy,⁹ and higher empathy specifically when observing another in pain. Neurobiological factors (such as oxytocin, female sex hormones, and endogenous opioids) have been proposed as the mechanism behind the increased tendency for women to display more nurturing behaviours in social relationships.¹⁴ One may consider that the effect of social support on pain experience may be stronger in dyad pairings with a female observer. The results of the study by Edwards et al found that the effect of social presence on pain reporting was strongest for male–male dyads, compared with the other possible dyad pairing combinations. This effect may arise from men believing that they need to be perceived as “macho” in front of their male peers, and to not display weakness to the pain,⁵ thereby leading to a reduced communication of pain, even if the perceived intensity of the pain does not change.

There are a number of potential implications for future research. In addition to considering the role of psychosocial trait characteristics (catastrophising, fear of pain, and empathy) and social support on pain experience, future studies should also consider whether competitiveness between friends occurs more within same-sex dyads, particularly in male–male interactions. Furthermore, investigating how self-reported masculine and feminine traits affect the experience of pain in same- and opposite-gender dyads, rather than same- and opposite-sex dyads, would provide further information about the role of psychosocial factors on the communication of pain. As highlighted by Edwards et al, enhancing the understanding of the social experience of pain, and how pain is communicated differently depending on the social context, could have interesting implications for clinical pain, although these remain speculative at the current time. Future research on this topic should ensure that appropriate objective measures of pain perception are developed and measured alongside self-report in an attempt to measure the potential modulatory effects of social factors on all aspects of pain experience.

Disclosures

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