



Topical review

Worry and chronic pain: A misdirected problem solving modelChristopher Eccleston^{a,*}, Geert Crombez^b^a Pain Management Unit, School for Health, The University of Bath & The Royal National Hospital for Rheumatic Diseases, NHS Trust, UK^b Faculty of Psychology and Educational Sciences, Ghent University, Ghent, Belgium

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1. Introduction

“Sleepless in the early hours, you make a nest out of your own fears – there must have been survival advantage in dreaming up bad outcomes and scheming to avoid them. This trick of dark imagining is one legacy of natural selection in a dangerous world. This past hour he’s been in a state of wild unreason, in a folly of overinterpretation” [21, p. 39].

An important human faculty is our ability to verbally ruminate on possible negative outcomes and plot methods of avoidance or escape. In his novel ‘Saturday’ Ian McEwan succinctly captures the features of worry that make it psychologically relevant to our consideration of chronic pain. First, worry is related to the perceived threat of danger; second, we worry not about what was but about what might be (it is future orientated); third, it functions to promote avoidance; fourth, it is exacerbated when external competition for attention is low (e.g., at night) and finally, it can be hard to control, going unchecked by reason, logic, or self-persuasion. In this topical review we argue that worry is a valuable construct for investigation of the cognitive reality of chronic pain. We begin by defining the construct of worry and map its boundaries within the larger field of fear and anxiety. Next, we apply worry to chronic pain describing how it operates within the context of pain and dis-

ability. Finally, we propose a model of worry and problem solving in chronic pain, and discuss its theoretical and clinical implications.

2. Worry

Borkovec et al. [2] defined worry as “...a chain of thoughts and images, negatively affect laden and relatively uncontrollable. The worry process represents an attempt to engage in mental problem solving on an issue whose outcome is uncertain but contains the possibility of one or more negative outcomes”. Worry is commonly sampled in affective disorders and a pathological form of worry is a central feature of Generalized Anxiety Disorder [5]. Related processes of verbal rehearsal have been studied in depression, where ruminating over past negative events is a common feature [26]. In panic disorder, and many phobias, worry takes a form of repetitive ‘what if’ type catastrophizing questions and related attempts to avoid negative consequences [28]. Despite its common occurrence in affective disorders, worry is essentially a normal process. Studies with a number of non-clinical samples have shown that people worry largely about socio-evaluative issues such as social competence, relationships, and personal fulfillment [30], or the threat to physical wellbeing such as ill health, pain and discomfort [14]. People experience these worries frequently and report them to be unwelcome, intrusive, and hard to control [34]. Although unwelcome, worry may be beneficial. Several authors have stressed that worry functions first to maintain vigilance to the unresolved threat, and second, to maintain an engagement

* Corresponding author. Address: Pain Management Unit, Level 7 Wessex House, The University of Bath, Bath BA2 7AY, UK. Tel.: +44 1225 386439.

E-mail address: c.eccleston@bath.ac.uk (C. Eccleston).

in finding a solution to the threatening problem. Indeed, normal worrying has been shown to promote successful problem solving [7].

3. Chronic pain, worry, and problem solving

Pain is an ideal habitat for worry to flourish. Consider the following example. Imagine an uncomplicated pain of a few seconds duration. On being alarmed by pain one acts immediately to escape its perceived cause. Worry may occur but typically it will also be short lived. However, consider the complication that pain persists, despite one's efforts to achieve analgesia. In this situation worry may emerge as a means to give variety to problem solving attempts. In low back pain, for example, patients report worry about the causes and potentially disabling consequences of untreated pain [22]. Consider further the situation that despite years of attempting to solve the problem of pain it stubbornly resists solution. People with chronic pain may then be confronted with many unresolved threats to their mental and physical health and many challenges to their social competence [23].

The survival of worry in the context of insoluble chronic pain is an intriguing anomaly in this functional account. If worry functions to promote problem solving, it should follow that, in the absence of any possible solution, worry should extinguish. However, worry does not extinguish and in many cases increases. Patients with chronic pain report that they worry about pain for longer than other non-pain problems, and report their worries to be more distressing, attentionally demanding, and difficult to control [13]. There may be several reasons why worry does not stop when pain is insoluble. First, pain is biologically hardwired to interrupt current engagement and capture attention, even in situations of false alarm [12]. Second, when pain blocks the accomplishment of valued goals, one is highly motivated to overcome the perceived obstacle, and to solve the pain problem (see [16]). Third, worry has self-perpetuating features. It is self-reinforcing because in the absence of any other purposeful activity, one is at least active in searching for a solution, one has not surrendered [10]. Further, it may install a hypervigilance for pain and for cues that have become associated with pain, and narrows the attentional focus upon the problem to be solved, largely at the expense of engagement in other activities [6].

From this perspective one can view the person with chronic pain as an active problem solving agent, one who despite failure and disappointment continues searching for solutions. Characterizing the patient in this way brings into view an uncommon perspective. How successful one is in solving problems may be a function of problem solving style, i.e., one's ability to formulate problems accurately, the extent to which

one is able to generate a variety of solutions, and one's ability to resist becoming fixed within a narrow problem frame. In addition to problem solving style, confidence in problem solving ability has also emerged in the literature as a potentially important mediator [7]. However, in a recent study of chronic pain patients we found no differences in general problem solving style when compared with people with pain who were not patients, and compared with published non-pain norms [8]. Similarly, Van den Hout et al. [32] also found that chronic pain patients did not show deficits in general social problem solving skills, and problem solving style did not help explain disability. However, Kerns et al. [18] found some evidence for low confidence in one's problem solving ability to be related to increased pain, depression and disability [35].

How one frames a problem may be more important than one's general abilities to solve problems, or one's problem solving confidence. The dominant framing of the problem of pain in post-industrialized societies is as a biomedical one, the cause and treatment of which are to be found with powerful external others. For example, patients with back pain who strongly endorse the belief that pain is caused by spinal injury can become readily fearful and then avoidant of back-straining activities [15]. Similarly, health care professionals who work with patients in pain also endorse beliefs about the physical causes and treatments of pain [4]. There are no published studies of problem framing and its effects upon the selection of solutions by chronic pain patients. Similarly, there are no studies of patients' flexibility in formulating pain problems (although see Karp et al. [17] for an interesting related study).

4. A model of misdirected problem solving

The idea that framing a chronic pain problem in biomedical terms can lead to greater suffering and disability is not unique [1]. An influential example is the 'fear-avoidance' model which focuses on catastrophic thoughts about pain and the largely erroneous belief that back pain, and its consequences, is caused by serious injury. This model positions pain behavior as part of a class of phobic behavior [19]. More recently, the communal coping model emphasizes the communicative function of pain catastrophizing in achieving empathy and support [29]. In proposing a model of misdirected problem solving, we seek to build on the observations enabled by these models and reframe them within an approach that positions the patient as an active problem solver in a world dominated by multiple threats.

Fig. 1 shows a representation of the misdirected problem solving model. The model is exemplified serially. As an example, we narrate a prototypical experience of a chronic pain patient through the model. First, the chronic pain patient, it should be remembered, lives in

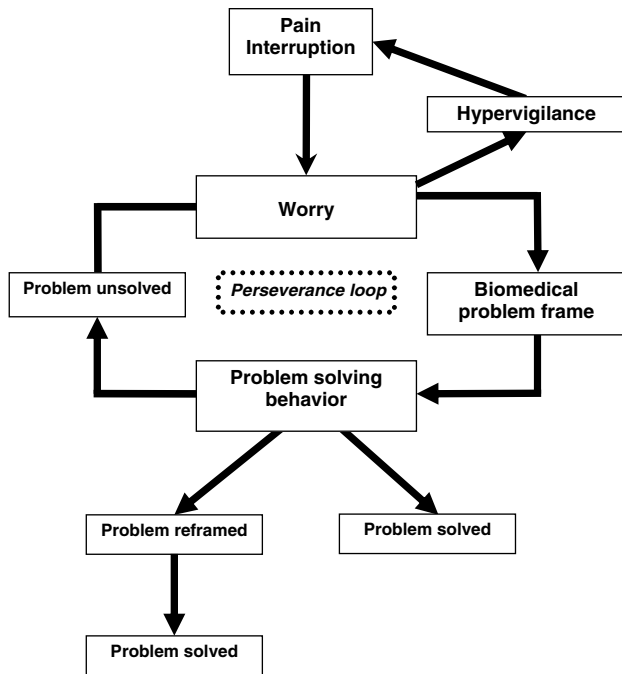


Fig. 1. Misdirected problem solving model.

the context of enduring pain which repeatedly interrupts attention and fuels worry. Patients worry about the possible causes of pain and the variety of negative consequences for self and others. Along with worrying about pain, hypervigilance to pain emerges. Pain is often then positioned as the primary cause of the range of negative outcomes and is framed as a biomedical problem. Such a framing leads easily to solutions focused on the removal of pain. Where such problem solving leads to success, pain and worry abate. However, when the problem solving attempts fail to find a solution, worry is fueled. A ‘perseverance loop’ is established in which the failure of a solution to the problem of pain amplifies worry. In this loop increased worry functions to strengthen motivation to persevere in solving the problem. Problem formulation becomes narrowed and inflexible, whilst greater effort is employed repeating the same solutions. If on repeated attempts a solution is achieved, again pain and worry will stop. This normal process of perseverance mitigates against premature surrender [27]. However, if the same negative outcomes are obtained, one may become ‘stuck’ in the perseverance loop. In this model the chronic pain patient is far from passive. The narrowing of a problem frame occurs because of increased recruitment of effort in attempting to problem solve. Paradoxically, it may be the very narrowing of frame and increase in effort toward a specific goal that maintain suffering. When fixed within a perseverance loop, reframing does not readily occur as an option for consideration. Reframing, however, may be the only viable strategy remaining.

5. Theoretical implications

Reframing the theoretical problem of chronic pain in this way affords a re-analysis of a number of frequent observations. First, a common feature of chronic pain ‘patienthood’ is the high level of demand for medical and associated services, sometimes pejoratively known as ‘doctor shopping’. Such repetitive behavior may be helpfully understood as the result of a patient becoming fixed within a perseverance loop. Such patients should be considered at high risk of multiple interventions because of an eagerness to pursue solutions that appear to promise pain relief. Second, a further observation is that despite disconfirmatory evidence that a solution is possible, patients remain actively engaged in the search for such solutions. Intriguingly, De Vlieger et al. [9] reported that pain catastrophizing was related to attempts to solve pain despite very little belief that a solution exists. Repeating failed attempts at a solution appears to be preferable to abandoning the search for a solution. In this way, perhaps, depression is kept at bay, or at least its self-defeating characteristics are blocked [25]. Third, we should perhaps expect that patients caught in such a perseverance loop will present as less flexible in reasoning about pain, less sensitive to information that disconfirms their problem frame, and more likely to interpret attempts to change the problem frame to one of coping as evidence only of rejection and deligitimation [11]. Finally, being fixed in a perseverance loop can have general negative consequences on health. Repeated interruption, worry, and failure to achieve relief can leave one in a state of perpetual preparedness to act, with associated high levels of arousal that are thought to lead to immune, endocrine, and neurovisceral overactivity, potentially sensitizing one to multiple somatic complaints [3].

6. Clinical implications

Pharmacological, physical, and surgical treatments are frequently employed in the pursuit of pain relief. Some psychological techniques, such as attention management, are also aimed at altering pain and its interruptive quality. However, other psychological approaches do not share the same problem frame, in which pain relief is the desired solution. For example, recent developments in cognitive therapy focus directly on changing aspects of worry, in particular in techniques to control catastrophic thinking [31]. Also, techniques of exposure to pain-inducing activity focus on confronting patients with disconfirmatory information that might change the problem frame [33]. Traditional programs of cognitive behavioral therapy are replete with techniques of increasing problem solving skills and confidence related to coping with disability [24]. And, recent advances in acceptance based treatments directly address this issue of problem frame [20]. Integral to such an approach are the dual therapeutic goals of

enabling patients to disengage from the pursuit of the unachievable goal of pain relief, and the fostering of the ability to live a valued life in the presence of pain.

7. Conclusion

Worry functions to keep problems at the forefront of one's attention and promotes problem solving. When problems are poorly framed, as in the chronic search for pain relief, attempts at problem solving can be usefully considered to be misdirected. Chronic pain patients can be thought of as trapped in a 'perseverance loop', actively and repeatedly engaged in effortful attempts to solve the wrong problem. Interventions aimed at enabling patients to break out of the perseverance loop and change the problem frame may be more effective than interventions that appear to endorse the patient's view of the problem as one that can only be solved by pain relief.

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