



Review article

The role of emotion regulation in chronic pain: A systematic literature review

Helen Koechlin^{a,b,*}, Rachael Coakley^b, Neil Schechter^b, Christoph Werner^c, Joe Kossowsky^{a,b}^a Department of Clinical Psychology & Psychotherapy, University of Basel, Switzerland^b Department of Anesthesiology, Perioperative, and Pain Medicine, Boston Children's Hospital, Harvard Medical School, Boston, USA^c School of Psychology, University of Sydney, Australia

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ABSTRACT

Objective: Emotion regulation (ER) includes a set of cognitive and attentional processes used to change or maintain emotional state. A small but growing body of research suggests that maladaptive ER might be a risk factor for the development of chronic pain. This review aims to summarize existing literature on the association between ER and chronic pain, and to determine whether the construct of ER may further enhance our understanding of the risk and protective factors that may contribute to the onset and maintenance of chronic pain.

Methods: A systematic search was conducted using the search terms “chronic pain” and “emotion regulation.” Studies that measured both constructs across all age groups were included.

Results: We found 15 studies that met our inclusion criteria. Nine studies were completed within the last five years, suggesting that the evaluation of ER as it relates to pain is a new line of research. Studies that measured “response-focused” ER found associations between maladaptive ER and pain. Studies that measured “antecedent-focused” ER strategies were less likely to show a direct association with pain.

Conclusion: Maladaptive response-focused ER may be an important risk factor in the development and maintenance of chronic pain, as it is associated with pain and psychological comorbidities. Adding ER to chronic pain investigations may help to further explain individual differences in the risk and protective mechanisms that are known to influence chronic pain. Importantly, this line of research has potential to directly inform future interventions for patients with chronic pain.

1. Introduction

Chronic pain is defined as any pain condition that exists for more than three months, either continuously or recurrently [14,48]. Chronic pain is estimated to affect 20% of the population and causes an enormous burden to both individuals and the healthcare system [25]. Current models of chronic pain illustrate the complex interplay of sensory, environmental, psychological, and pain regulatory risk factors that shape the pain vulnerability of an individual ([55]; see Fig. 1). Research on chronic pain seeks to disentangle the various risk and protective influences of biological, psychological, and environmental factors that are known to contribute to chronic pain disorders. Understanding these factors is critical to the development and implementation of targeted intervention.

Pain has long been defined as an “unpleasant sensory and emotional experience” ([40]). The recognition of the sensory and psychological components of pain have recently been strengthened by controlled laboratory studies that illustrate the link between emotional state and

pain perception, both in healthy volunteers (e.g. [24,43]) and in patients with chronic pain (e.g. [50]). Additionally, research using fMRI has supported the notion that inducing negative mood can influence subsequent pain ratings [11]. Beyond the research linking the sensory and emotional experience of pain, patients with chronic pain have three times the risk of being diagnosed with anxiety and depression as compared to the general population [7,26,49]. Despite the multiple links between pain and negative emotions, surprisingly little is known about how emotion regulation styles may influence pain, pain-related disability, and psychological comorbidities in chronic pain populations.

Emotion regulation (ER) describes a person's ability to modulate his or her emotional state and expression, that includes influencing which emotions people have, when they have these emotions, and how emotions are experienced and expressed [1,31]. Assessment of ER thus encompasses measurement of cognitive, behavioral, and psychophysiological responses to an event or stressor [18,56]. The regulation of emotions has been the focus of various studies, among them studies in the field of stress and coping research [31]. However, ER is different

* Corresponding author at: Department of Clinical Psychology and Psychotherapy, University of Basel, Missionsstrasse 62, 4055 Basel, Switzerland.
E-mail address: helen.koechlin@unibas.ch (H. Koechlin).

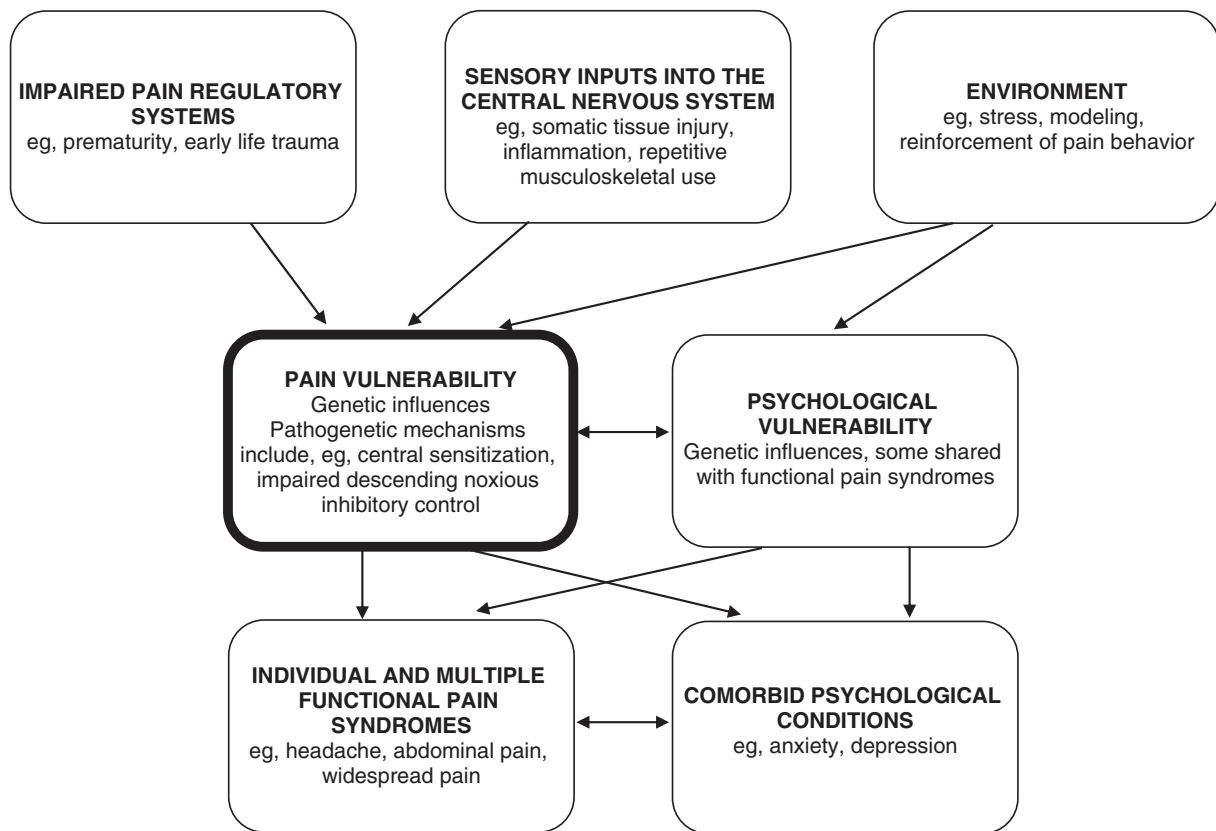


Fig. 1. Antecedents and consequences of pain vulnerability [55].
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from coping on the one hand in that coping includes non-emotional actions; ER on the other hand includes processes not traditionally considered in the coping literature, such as maintaining or up-regulating positive emotions [15].

A helpful model of organizing the diverse cognitive and behavioral strategies people use to regulate their emotions is the Process Model of ER [30,34]. The Process Model of ER is based on the modal model of emotion, which presents the core features of emotions and specifies that ER can set in at every step of the emotion generation process: Emotion arises in a *situation* that is meaningful to the individual and demands *attention*, has a particular *meaning* and gives rise to a multifaceted, embodied *response* (see Fig. 2). The Process Model broadly divides ER into antecedent- and response-focused strategies. Antecedent-focused strategies include situation selection, situation modification, attentional deployment, and cognitive change, that set in before the emotion is fully developed – hence their prospect of success is generally greater [3]. Strategies such as avoiding a situation that potentially elicits negative emotions or shifting one's attention to thoughts of an upcoming vacation to prevent boredom in a long work meeting are considered antecedent-focused. In contrast, response-focused strategies emphasize

regulating the emotional response, especially its physiological and behavioral aspects, once the event has already onset [29,38]; holding back one's tears in public is one example.

ER is considered maladaptive if it shows a negative short- and/or long-term outcome, antagonizes personal goals or shows a lack of ER flexibility (i.e., is inappropriate to contextual or social demands [5]). Research on ER has studied how ER affects the individuals as well as the people around them. This has yielded results linking maladaptive ER to psychopathology (for a review see [4]), negative affect [9], learning difficulties [17], memory deficits [19,42], and physiological stress reactions [13]. Importantly, research has demonstrated that training in adaptive ER is effective for treating a range of psychological and psychosocial difficulties. As a result, these skills and strategies are often incorporated as a component part of cognitive behavioral therapy treatment [10,27].

This systematic review synthesizes the existing body of research that explores the relationship between ER and chronic pain. To our knowledge, this is the first review to examine the ER – chronic pain relationship. Our goal is to investigate whether the construct of ER may enhance the existing theoretical frameworks of chronic pain, to increase our understanding of individual-level risk and protective influences that contribute to development and maintenance of chronic pain conditions. Further, we seek to explore the associations between the two categories of ER, antecedent- and response-focused strategies, and chronic pain. Based on our understanding of the process model of ER, we hypothesize that response-focused ER is more likely to have negative associations with chronic pain as compared to antecedent-focused ER.

2. Methods

For this systematic review, we searched PubMed, Embase, PsychInfo, Web of Science, CINAHL, and the Cochrane Central Database

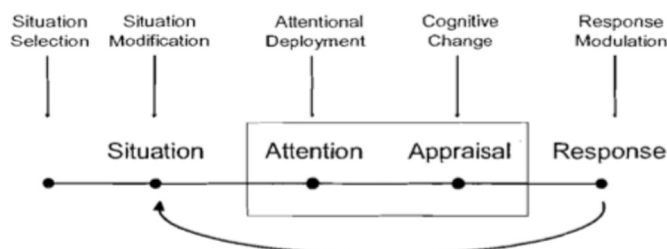


Fig. 2. The Process Model of Emotion Regulation [34].
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