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Predictors of Both Sensorial and Affective Dimensions of Pain

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Abstract

Pain catastrophizing is defined as a maladaptive cognition, comprising three different dimensions, measured by Pain Catastrophizing Scale. Considerable research has shown that pain catastrophizing is a significant determiner of pain experience and pain-related outcomes. Relationships between pain catastrophizing, pain intensity, and pain tolerance have been shown in several clinical populations.

Keywords: Pain intensification; Clinical populations; Distinct roles in Pain; Pharmacological agents; Psychological interventions; Path analyses;

Introduction

It is associated with decreased pain tolerance and higher pain severity among patients with rheumatoid arthritis, with more severe and widespread pain, with higher levels of emotional distress among individuals with fibromyalgia and scleroderma, and with disability up to 6 months postoperatively in patients who have had knee surgery for osteoarthritis. Also, anxiety is associated with pain intensity, pain tolerance as a response to pain intensification, prolonged elevation of pain levels, or anticipation of increased pain [1]. Studies on clinical population suggest that preoperative psychological distress has a significant impact on postsurgical recovery, and it is associated with poor clinical outcomes after surgery to the hip, knee, and lumbar spine. Specifically, higher levels of preoperative state anxiety are associated with increased postoperative pain intensity, which may significantly influence pain tolerance. It is generally accepted that pain catastrophizing and anxiety are theoretically distinct from one another [2]. Also, there is evidence to suggest that the two, although associated, have distinct roles in pain. For example, pain catastrophizing has been shown to predict the unique variance in functional disability over trait anxiety in a community sample of children and the variance in pain and disability over negative affectivity in a small clinical sample of youths with chronic pain. Given their impact on pain intensity, response expectancies emerged as a predictor of pain-related outcomes, with an important contribution in the understanding of pain experience [3]. It has been claimed that non-volitional responses, including pain reactions, are impacted by response expectancies. They were defined as the expectation that a non-volitional response will occur, as a function of behaviour or a specific stimulus. More specifically, response expectancies regarding the appearance of a non-volitional response are sufficient to create non-volitional outcomes, such as memory reports, pain perception, responses to psychotherapy, sexual arousal, asthmatic responses, and mood. They are not mediated by other psychological variables. For example, in case of placebo effects, the effects of hypnotic suggestion, and the effects of pharmacological agents and medical interventions were not identified any psychological mechanisms to explain their impact on behaviour [4].

Methodology

Moreover, response expectancies are self-confirming and might be influenced by verbal instructions, such as the information's regarding the effect that a procedure is expected to have. Moreover, response expectancies are self-confirming might be influenced by verbal instructions such as the information's regarding the effect that a procedure is expected to have. Also, the expected pain level is correlated with the experienced pain level. In chronic pain, response expectancies and pain catastrophizing influence the large individual differences that can be observed in the co-variation of daily mood and daily pain [5]. Specifically, response expectancies for pain tolerance are predictive of pain intensity and the level of pain tolerance. Thus response expectancies might potentially explain the relation-ships between pain catastrophizing/state anxiety and pain tolerance/pain-related anxiety, although little is known about how they influence these relationships in aversive contexts. Since pain and comorbid emotional distress appear to be inseparable processes, a trans-diagnostic perspective would facilitate the flexibility in delivery of psycho-therapeutic interventions [6]. Psychological interventions are useful for patients with acute pain, who follow painful medical procedures, or for patients who developed chronic pain. As literature suggests, a painful event might activate specific beliefs about pain and threat, which activate negative dysfunctional emotions, with a negative impact on recovery. For example, patients with depression are three times less likely than non-depressed patients to adhere to treatment recommendations. Also, patients who reported depression symptoms reported significantly more pain, while the presence of persistent pain significantly increases the risk of future depression, major depression or anxiety, and vice versa [7]. Likewise, people with chronic pain frequently report significant expressions of fear and anxiety in both community and treatment-seeking samples.

Discussion

Conversely, the prevalence of pain among patients with major depression ranged between 15 and 100 percentage. The relation between pain and emotion is bidirectional. Therefore, hospitalized patients who follow painful procedures could benefit the most from interventions addressed to the management of dysfunctional emotions and pain, preventing them from developing chronic pain, disability, or psychopathology [8]. As previously mentioned, the trans-diagnostic approach assume that certain psychological processes contribute

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in a causal way to the development and maintenance of symptoms and suggest that they are underpinned by common psychological mechanisms as shown in (Figure 1). From this perspective, it would be useful to identify the adaptive strategies and to facilitate the integration of psychotherapy into diverse health care settings. Participants from the aversive condition received written information which informed them that in some extreme cases, the cold-presser task could be dangerous and might result in a serious degeneration of the immersed hand, while those in the neutral condition were told that the task was very similar to searching for a drink in a freezer and that it would not result in any physical injury. After signing the informed consent, participants were then instructed to place their hand into the water and to keep it immersed for as long as they could tolerate. After 5 minutes, participants were told to extract their hand. The data were screened for missing values and outliers, as these can have a significant impact on path analyses [9]. For both experimental conditions, the path analytic model was tested separately for each of the main outcome in the study, namely pain tolerance and pain-related anxiety. Pain tolerance was the total time, in seconds, that the participant's hand was immersed in the water, minus pain threshold time. Pain threshold was determined by asking participants to report the moment when they began to feel pain or discomfort. The time, in seconds, between the start of the immersion and the reporting of the pain was recorded as the pain threshold. Path analysis was used to identify the model that was the most predictive for pain tolerance and pain-related anxiety. We found one model that fit the data well. This model was tested for each experimental condition, considering pain tolerance and pain-related anxiety as separate outcomes. This statistical method is an extension of multiple regressions [10]. Response expectancies for pain tolerance were tested as a mechanism of both pain tolerance and pain-related anxiety. We also tested whether response expectancies for pain tolerance indirectly predict pain tolerance and pain-related anxiety, via pain intensity as shown in (Figure 2). Two different activating contexts were experimentally induced. The threat value of cold-presser pain was manipulated using written information about the task and the procedure was performed by healthy/pain-free volunteers [11]. Our results showed that the experimental manipulation was successful: participants in the aversive condition reported significantly higher levels of anxiety prior to the task. The proposed path model, which was based on a priori considerations and past research, fit the data well. Our results demonstrate that aversive contexts have an important influence on pain tolerance and pain-related anxiety. Significant paths were found for the aversive condition, separately predicting pain tolerance and pain-related anxiety. Our results indicate that these outcomes are influenced by an aversive perception of the task, which activates threat anxiety and distorted cognitions [12]. The path analytic model shows that for the aversive condition, response expectancies for pain tolerance significantly predict pain intensity and pain tolerance, while in neutral condition they predict only the intensity of the pain [13]. Interestingly, response expectancies were not the mechanism for the relationship between pain catastrophizing and pain tolerance/pain-related anxiety, but instead they mediated the relationship between state anxiety and pain tolerance/pain-related anxiety. Pain intensity also mediated the relationship between response expectancies and pain tolerance/pain-related anxiety, in separate models. These results emphasize the findings described in literature, namely that response expectancies predict non-volitional responses. Nevertheless, in aversive contexts, response expectancies may also be expressed in the form of behavioural responses, such as pain tolerance. We have therefore demonstrated that they are relevant mechanisms which may influence the level of perceived pain, pain tolerance, and pain-related anxiety. In the aversive condition, pain catastrophizing significantly predicts pain tolerance and pain-related anxiety, while in a neutral context it is not predictive [14]. Therefore, as the previous literature suggests, pain catastrophizing might represent a latent construct, requiring sufficient activation in order to exert its effects. These results confirms that a negative activating event may high-light cognitive vulnerabilities or may emphasize latent maladaptive thoughts in need of a cue to become manifest. Catastrophic or dysfunctional beliefs need threat, real or inferred, to elicit emotional or behavioural responses. Since context may activate underlying beliefs, the literature suggests that it is strongly relevant to pain-related outcomes. Once activated, maladaptive beliefs may also have a significant impact on behavioural and emotional responses. Catastrophizing is one of four irrational beliefs, a main mechanism, and an important target for Cognitive Behavioural Therapy interventions in broad area of psychopathology [15]. Pain catastrophizing have also been treated as an index of change of dysfunctional cognition and represents a therapeutic mechanism by which CBT can reduce pain and improve functioning. In our study, state anxiety predicted pain tolerance and pain-related anxiety by the way of response expectancies, with higher levels of anxiety predicting lower response expectancies for pain tolerance. These results replicate previous findings described in the literature, which state that the mechanism through which anxiety perpetuates its

Figure 1: Transdiagnostic approach that psychiatry contribute to development and maintenance of symptoms.

Figure 2: Response expectancies for pain tolerance.

effect is based on response expectancies. For the advance in the field, research suggests that identifying the mechanisms that would afford a greater understanding of both problems would facilitate the progress concerning the theoretical understanding and treatment of pain and emotion. Also, given the lack of a clear theoretical understanding of the processes involved, the treatment of these comorbid factors needs more research. Our study showed that cognitive and emotional factors are closely linked with pain tolerance and pain-related anxiety, especially in aversive condition. Also, these results highlight that pain tolerance and pain-related anxiety share common mechanisms when threat is perceived. As previously stated, in order to add data to the trans-diagnostic model for pain and emotion, we need to emphasize certain psychological processes contributing in a causal way to the development and maintenance of various symptoms observed across patients. Therefore, our data may add significant support for the trans-diagnostic model of pain and emotion. Although CBT is a theoretical approach with a powerful empirical support, efficacious either alone or as an adjunct to medication, and highly efficient regarding relapse and recurrence, there is still a strong need to address specific cognitive factors in order be more effective in reducing certain emotional dys-functionalities. Thus, literature encourages a better understanding of the involved cognitive factors and mechanisms of change assumed to increase the effectiveness of intervention packages..

Conclusion

Possible therapeutic targets underlying the process of patient adaptation to aversive circumstances. From a CBT perspective, they consist in patient cognitions and behaviours. For patients who suffer from acute pain, thoughts/cognitive processes, emotions, and behaviours are interconnected.

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Conflict of Interest

None

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