Topical Review

Cognitive Dimensions of Anger in Chronic Pain

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Number of text pages: 9

Number of tables: 0

Number of figures: 0

Keywords: Chronic pain; anger; cognitive; perceived injustice; goal frustration; external attribution; treatment

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1. Introduction

Anger has long been recognized as an integral part of pain experience [1; 19]. Reviews highlight the deleterious effect of anger on social, clinical, and functional outcomes [9; 22; 32]. Anger has been discussed as an aversive emotional state ranging from mild irritation to fury [25] and comprising specific cognitive attributions and action tendencies [21; 34]. Anecdotal and empirical data suggest that anger is commonplace among chronic pain sufferers [32]. In their 2003 review, Greenwood et al. [22] identified anger as an important target of research and behavioral management; since that review, research has highlighted biopsychosocial mechanisms through which anger may affect pain experience [5; 9; 33]. However, to date, no systematic line of research has addressed the cognitive dimensions of anger in chronic pain. We believe that elucidating these facets of anger in pain sufferers might strengthen the empirical foundation for more effective treatment. While not exhaustive, the current review highlights potential sources of anger among pain sufferers by drawing on conceptualizations from existing social psychological theory and newly evolving lines of research. From this basis, we discuss the role of anger in treatment settings and possible frameworks for research and intervention.

2. Anger in pain: State of the evidence

Research over the past two decades reveals a robust relation between anger and adverse pain outcomes [5; 25]. Higher anger expression has been linked with decreased experimental pain tolerance and greater reported pain intensity, as well as with increased post-surgical pain report and analgesic intake [7]. Anger is associated with pain intensity across a number of chronic pain conditions, including headache, fibromyalgia, complex regional pain syndrome and back pain [25]. Higher anger expression is prospectively associated with poorer functional outcomes such as physical performance deficits and work disability [32]. Correlates of anger include detrimental health behaviors, maladaptive coping responses, and poor sleep quality [25]. Studies of interpersonal consequences of anger in chronic pain suggest associations with less social support and greater interpersonal conflict [20]. There is likewise a well-documented relationship between anger, anxiety, and depression [25; 28].

Recent research has examined the role of anger regulation strategies [10], highlighting ironic processes, symptom-specific muscle tension, and alterations in endogenous pain inhibitory mechanisms as possible pathways by which anger exerts negative impact [6; 33]. Although the relationship between anger and pain is well established, this recent work suggests that it is far from straightforward. Targeted efforts to better understand the anger experience are warranted, and our focus on the cognitive dimensions (or substrates) anger is intended to spur those efforts.

3. Cognitive Dimensions of Anger: Clues from Social Science

Research and theory suggest a number of candidate cognitive dimensions of anger in chronic pain, including goal frustration, external attribution for negative outcomes (i.e., blame) and perceived injustice. We briefly summarize research related to each construct and highlight directions for future research.

Goal Frustration. Frustration-aggression models suggest that anger arises from external obstructions to personally significant goals [2]. Among individuals with persistent pain, anger may emerge from frustration experienced as a result of compromised goal pursuits; altered goal appraisal and strategy in the context of pain has been extensively discussed by Karoly and colleagues [26; 27]. Frustration may be particularly salient when pain interferes with activities that define identity in specific life-domains (e.g., parent, spouse, friend, worker), fostering role loss and identity erosion [23; 30]. In turn, discrepancy between one's actual and hoped-for identity has been linked to emotional distress and depression in chronic pain sufferers [30], as has the degree to which individuals feel that achieving their goals is *contingent* on pain relief [30].

For many chronic pain patients, efforts at complete pain relief are likely to be associated with repeated failure. Rigid pursuit of finite pain relief has been associated with greater distress and hypervigilance to pain sensations [14]. Pain sufferers may become trapped in a cycle of “misdirected problem solving”, characterized by continued perseverance and frustration regarding efforts to extinguish pain (Carver& Scheier's discussion of goal monitoring and affect is particularly relevant here [12]). When increased attention to pain and its eradication occurs at the cost of once valued or identity-relevant pursuits, this narrowed motivational perspective may further exacerbate pain-related losses and identity disruption [17].

External Attribution. Attribution theory suggests that individuals are motivated to understand the cause of events in their day-to-day lives. Anger is thought to emerge when self-relevant negative outcomes are attributed to external rather than internal agency [31]. Consistent with this perspective, anger is associated with degree of blame that individuals with pain ascribe to negative events in their lives [15; 29]. While blame can facilitate coping in specific situations (e.g., accident victims [24]), the overall trend is toward negative outcomes [37]. Crime victim research suggests that externalization of blame may in the long run leave individuals experiencing a lack of behavioral control over negative outcomes, ultimately increasing feelings of distress and helplessness [40]. Among chronic pain patients, DeGood and Kiernan [15] found that those who blamed others for their pain reported more pain and emotional distress than those who did not ascribe fault for their pain condition.

Research has identified varied targets of anger in chronic pain patients, including medical and mental health providers, the legal system, third-party payer, employers, significant others, god, self, and the whole world [19; 32]. However, little attention has been given to the cognitive content of anger toward these targets, leaving the question open to inquiry. Moreover, existing studies make little distinction between anger and blame per se, leaving open the question of what (if any) responsibility patients ascribe to outside agents in terms of their pain condition.

Perceived Injustice. Classical definitions of anger highlight the perceived illegitimacy or unfairness of an instigating event. Central to anger is appraisal that one has somehow been wronged [19; 34]. Berkowitz & Harmon-Jones [3] quote Frijda: “An angering event is one in which someone or something challenges what ‘ought’ to happen” [21]. Recent work has drawn attention to the fact that chronic pain patients often perceive themselves as victims of injustice, conceptualized by Sullivan et al. [35] as a set of cognitions comprising attributions of blame, magnitude of loss, and irreparability of loss.

Studies in occupational and social/organizational psychology reliably demonstrate the negative impact of perceived injustice on physical and mental health outcomes [4; 13]. In the rehabilitation setting, higher perceived injustice was associated with missed clinic appointments, less improvement on measures of physical function, and lower probability of work return [35]. In one study, pre-treatment scores of perceived injustice predicted long-term work absence even when controlling for other medical, functional, and psychological variables [35]. Perceived injustice likewise emerged as a unique predictor of posttraumatic symptom chronicity among whiplash injury patients [36]. The role of perceived injustice in conceptualizations of anger and its negative impact among injured patients suggest that this may be an important area for future research and intervention. Moreover, as perceived injustice may inherently imply externalization of blame, research is encouraged to examine the extent to which injustice and blame cognitions overlap in contributing to anger in pain experience.

4. The Role of Anger in Treatment Settings

Examining cognitive dimensions of anger can help account for observed associations between anger and poor clinical outcomes. Below, we discuss how goal frustration, external attribution, and perceived injustice can negatively inform treatment through related pathways such as impaired engagement, disrupted therapeutic relations, and excessive focus on pain and injury.

Treatment Engagement. Repeated failures to achieve pain relief combined with externalized blame are likely to fuel anger and disrupt engagement in treatment. This is particularly true if patients frame their pain problem as necessitating absolute relief from an external biomedical source [17], or (relatedly) if patient treatment goals do not match those of the provider. A recent study found that chronic pain patients rated acceptable levels of pain relief as considerably greater (> 50%) than what is currently offered by cognitive behavioral therapy [38], suggesting an incongruence in patient-provider objectives that may magnify patient distress and anger. Additionally, it remains an interesting question whether external/blame attribution may promote outsourcing of responsibility for treatment progress and failure to agents such as treatment provider, workplace environment, or insurance carrier, thus sabotaging active participation in treatment efforts [18].

Therapeutic Alliance. Much attention been given to “difficult patients” in the pain treatment setting [39] and there is consistent evidence that patients’ anger expression impairs establishment of working alliance [8]. Perceptions of injustice, blame, and goal frustration may foster disturbed therapeutic relations with treatment providers and others in the social environment. Themes of perceived injustice and deserved retribution may be reflected in feelings of ‘entitlement’ among chronic pain sufferers, recently documented by Cano et al.

[11]. Greater entitlement to social support was in turn associated with punishing spousal responses and perceived spousal invalidation [11].

Hostile interactions are not surprising given that the specific motivation-action tendency most frequently associated with anger is that of retaliation [21]. In response to perceived insult, one is motivated to right the wrong or remove obstructions to desired outcome. The circumstance of chronic pain thwarts this natural action response, as the obstacle (i.e., pain) is often intractable, solutions obscure, and targets of blame imprecise.

Focus on Pain and Injury. Perhaps centrally, anger may undermine treatment by continually reinforcing the inherent tendency of pain to capture attention and achieve psychological priority [16]. Rumination regarding injustice, blame, and goal disappointment may steer attention toward “unsolvable” issues, while simultaneously detracting from evidence-based treatments and exacerbating distress. Patients may become mired in a preservative cycle similar to that suggested by the Misdirected Problem Solving model of pain [17]. In line with this, some anecdotal data suggest that perceived injustice may draw priority away from treatment involvement. Sullivan et al. [35] note that in group discussions, “perceived injustice seemed to focus individuals’ attention on the injustice of their injury or accident as opposed to…their role in the rehabilitation process” (p. 258). Fueled by anger cognitions, efforts may be directed away from restoration of functional identity and perhaps invested in demonstration of underserved suffering [18].

5. Directions for Treatment and Research

While this review highlights directions for potentially fruitful inquiry, we do not exhaustively characterize cognitive aspects of anger in persistent pain and such inquiry is indeed encouraged. Research should continue to examine the nature of anger cognitions among pain sufferers, including their impact on individuals’ orientation toward their pain condition and treatment, as well as the emergence/evolution of anger in the acute to chronic pain trajectory. Further research efforts would likewise shed light on other important psychological correlates of pain, such as depression, which shares a number of cognitive characteristics with anger (e.g., self-blame, rumination). Additionally, the development of viable assessment methodologies gauging anger-related cognitions would aid both theoretical understanding and clinical intervention.

While existing psychological interventions offer a number of well validated techniques that serve to reduce negative affect and build communication to enhance treatment engagement, no studies to date have examined the effectiveness of anger management interventions for pain sufferers. This is not surprising given our limited understanding of the experience of anger in chronic pain. Although anger management is often part of cognitive-behavioral treatment packages, attention should be given to the specific effectiveness of current treatment strategies for anger-relevant outcomes. Current research and treatment perspectives might likewise offer resources for improving anger interventions. For example, acceptance-based interventions explicitly target several themes of anger discussed above (e.g., identity disruption and goal frustration). The growing body of work on the state-trait interaction in anger regulation may inform the utility of specific anger interventions for certain portions of the pain population [10].

5. Conclusion

While feelings of anger are recognized as common among chronic pain sufferers, little attention has been given to the cognitive dimension of anger within the unique psychosocial context of chronic pain. In conjunction with flourishing research on anger regulation, we invite rigorous and systematic inquiry regarding the cognitive components of anger in persistent pain. Improved basic understanding of anger in this population is essential for development of more effective clinical interventions that will improve quality of life for patients and supply valuable tools for the provider community.

Conflict of Interest Statement

The authors have no other conflict of interest to declare with regard to this manuscript.

References

[1] Berkowitz L. On the formation and regulation of anger and aggression. A cognitive-neoassociationistic analysis. Am Psychol 1990;45(4):494-503.

[2] Berkowitz L. Appraisals and Anger: How Complete Are the Usual Appraisal Accounts of Anger? In: M Potegal, G Stemmler, C Spielberger, editors. International Handbook of Anger: Springer New York, 2010. pp. 267-286.

[3] Berkowitz L, Harmon-Jones E. Toward an understanding of the determinants of anger. Emotion 2004;4(2):107-130.

[4] Blyth FM, March LM, Nicholas MK, Cousins MJ. Chronic pain, work performance and litigation. Pain 2003;103(1-2):41-47.

[5] Bruehl S, Burns JW, Chung OY, Chont M. Pain-related effects of trait anger expression: neural substrates and the role of endogenous opioid mechanisms. Neurosci Biobehav Rev 2009;33(3):475-491.

[6] Bruehl S, Chung OY, Burns JW. Anger expression and pain: an overview of findings and possible mechanisms. J Behav Med 2006;29(6):593-606.

[7] Bruehl S, Chung OY, Donahue BS, Burns JW. Anger regulation style, postoperative pain, and relationship to the A118G mu opioid receptor gene polymorphism: a preliminary study. J Behav Med 2006;29(2):161-169.

[8] Burns JW, Higdon LJ, Mullen JT, Lansky D, Wei JM. Relationships among patient hostility, anger expression, depression, and the working alliance in a work hardening program. Ann Behav Med 1999;21(1):77-82.

[9] Burns JW, Quartana PJ, Bruehl S. Anger inhibition and pain: conceptualizations, evidence and new directions. J Behav Med 2008;31(3):259-279.

[10] Burns JW, Quartana PJ, Bruehl S. Anger management style moderates effects of attention strategy during acute pain induction on physiological responses to subsequent mental stress and recovery: a comparison of chronic pain patients and healthy nonpatients. Psychosom Med 2009;71(4):454-462.

[11] Cano A, Leong L, Heller JB, Lutz JR. Perceived entitlement to pain-related support and pain catastrophizing: associations with perceived and observed support. Pain 2009;147(1-3):249-254.

[12] Carver CS, Scheier MF. On the self-regulation of behavior. New York: Cambridge University Press, 1998.

[13] Colquitt JA, Scott BA, Judge TA, Shaw JC. Justice and personality: Using integrative theories to derive moderators of justice effects. Organizational Behavior and Human Decision Processes 2006;100(1):110-127.

[14] Crombez G, Eccleston C, De Vlieger P, Van Damme S, De Clercq A. Is it better to have controlled and lost than never to have controlled at all? An experimental investigation of control over pain. Pain 2008;137(3):631-639.

[15] DeGood DE, Kiernan B. Perception of fault in patients with chronic pain. Pain 1996;64(1):153-159.

[16] Eccleston C, Crombez G. Pain demands attention: a cognitive-affective model of the interruptive function of pain. Psychol Bull 1999;125(3):356-366.

[17] Eccleston C, Crombez G. Worry and chronic pain: a misdirected problem solving model. Pain 2007;132(3):233-236.

[18] Eccleston C, Williams AC, Rogers WS. Patients' and professionals' understandings of the causes of chronic pain: blame, responsibility and identity protection. Soc Sci Med 1997;45(5):699-709.

[19] Fernandez E, Wasan A. The anger of pain sufferers: Attributions to agents and appraisals of wrongdoing. In: M Potegal, G Stemmler, C Spielberger, editors. International

Handbook of Anger: Constituent and Concomitant Biological, Psychological, and Social Processes. New York Springer, 2009. pp. 449-464.

[20] Fitzgerald ST, Haythornthwaite JA, Suchday S, Ewart CK. Anger in young black and white workers: effects of job control, dissatisfaction, and support. J Behav Med 2003;26(4):283-296.

[21] Frijda NHTeC, England, Press. aNYCU. The emotions. . Cambridge, England: Cambridge University Press, 1986.

[22] Greenwood KA, Thurston R, Rumble M, Waters SJ, Keefe FJ. Anger and persistent pain: current status and future directions. Pain 2003;103(1-2):1-5.

[23] Harris S, Morley S, Barton SB. Role loss and emotional adjustment in chronic pain. Pain 2003;105(1-2):363-370.

[24] Hart T, Bogner JA, Whyte J, Polansky M. Attribution of blame in accidental and violence-related traumatic brain injury. Rehabilitation Psychology 2003;48(2):86-92.

[25] Iyer P, Rom Korin M, Higginbotham L, Davidson KW. Anger, Anger Expression, and Health. Handbook of Health Psychology and Behavioral Medicine 2010:120-133.

[26] Karoly P, Ruehlman LS. Motivational implications of pain: chronicity, psychological distress, and work goal construal in a national sample of adults. Health Psychol 1996;15(5):383-390.

[27] Karoly P, Ruehlman LS. Psychosocial aspects of pain-related life task interference: an exploratory analysis in a general population sample. Pain Med 2007;8(7):563-572.

[28] Linton SJ, Nicholas MK, MacDonald S, Boersma K, Bergbom S, Maher C, Refshauge K. The role of depression and catastrophizing in musculoskeletal pain. Eur J Pain;15(4):416-422.

[29] McParland JL, Whyte A. A thematic analysis of attributions to others for the origins and ongoing nature of pain in community pain sufferers. Psychol Health Med 2008;13(5):610-620.

[30] Morley S, Davies C, Barton S. Possible selves in chronic pain: self-pain enmeshment, adjustment and acceptance. Pain 2005;115(1-2):84-94.

[31] Neumann R. The causal influences of attributions on emotions: A procedural priming approach. Psychological Science 2000;11(3):179-182.

[32] Okifuji A, Turk DC, Curran SL. Anger in chronic pain: investigations of anger targets and intensity. J Psychosom Res 1999;47(1):1-12.

[33] Quartana PJ, Yoon KL, Burns JW. Anger suppression, ironic processes and pain. J Behav Med 2007;30(6):455-469.

[34] Scherer KR, Schorr A, Johnstone T. Appraisal Processes in Emotion: Oxford University Press. , 2001.

[35] Sullivan MJ, Adams H, Horan S, Maher D, Boland D, Gross R. The role of perceived injustice in the experience of chronic pain and disability: scale development and validation. J Occup Rehabil 2008;18(3):249-261.

[36] Sullivan MJ, Thibault P, Simmonds MJ, Milioto M, Cantin AP, Velly AM. Pain, perceived injustice and the persistence of post-traumatic stress symptoms during the course of rehabilitation for whiplash injuries. Pain 2009;145(3):325-331.

[37] Tennen H, Affleck G. Blaming Others for Threatening Events. Psychological Bulletin 1990;108(2):209-232.

[38] Thorne FM, Morley S. Prospective judgments of acceptable outcomes for pain, interference and activity: Patient-determined outcome criteria. Pain 2009;144(3):262-269.

[39] Wasan AD, Wootton J, Jamison RN. Dealing with difficult patients in your pain practice. Reg Anesth Pain Med 2005;30(2):184-192.

[40] Winkel FW, Denkers A, Vrij A. The Effects of Attributions on Crime Victims Psychological Readjustment. Genet Soc Gen Psych 1994;120(2):147-168.