



The impact of psychosocial factors on MSK pain

- **Samantha M Meints, PhD**, Department of Anesthesiology, Perioperative and Pain Medicine, Brigham and Women's Hospital, Boston, MA, USA; Harvard Medical School, Boston, MA, USA.
- **Robert R. Edwards, PhD**, Department of Anesthesiology, Perioperative and Pain Medicine, Brigham and Women's Hospital, Boston, MA, USA; Harvard Medical School, Boston, MA, USA.

Biopsychosocial Model of Pain

The biopsychosocial model of pain suggests that pain is a multi-dimensional, dynamic interaction among physiological, psychological and social factors that reciprocally influence one another¹. Despite considerable evidence to support the biopsychosocial model, psychosocial factors are often viewed as reactions to pain. However, longitudinal research supports a strong bidirectional link between psychosocial factors and MSK pain.

Affect

Depression, anxiety, and indices of emotional distress along with a cluster of negative emotions, thoughts and behaviors termed "negative affect (NA)" are among the most commonly-assessed psychological factors in patients with MSK pain². In addition to being a consequence of chronic pain, premorbid NA is a risk factor for the future development of MSK pain³. NA has also been shown to increase the likelihood of transitioning from acute to chronic MSK pain, for example following spine surgery and joint replacement².

On the other hand, positive affect, or the extent to which an individual experiences positive mood such as joy, energy, concentration, enthusiasm and alertness, is associated with less pain. Moreover, the impact of positive affect can buffer against the effects of NA. That is, among people with low back pain, having greater positive affect protects against the negative effects of having high levels of negative affect⁴.

Psychological Trauma

Increasing evidence suggests an association between psychological trauma and chronic MSK pain. There are strong prospective links between early-life traumatic experiences and the subsequent develop-

ment of chronic pain. Early life trauma including childhood physical, sexual, and psychological abuse are risk factors for the development of fibromyalgia and other painful MSK conditions. In fact, meta-analysis shows that past trauma is associated with 2-to-3-fold increase in the development of chronic widespread pain⁵.

Coping

Individual differences in pain coping, the use of behavioral emotional and cognitive techniques to manage symptoms of distress, influence pain-related outcomes including pain intensity, adjustment to chronic pain, and psychological and physical functioning. Active coping, strategies to control pain or function despite pain, are linked to positive affect, better psychological adjustment, less depression, better social function, and higher pain acceptance. On the other hand, passive coping, relinquishing control of pain to others, is linked to poorer outcomes including increased pain and depression among people with MSK pain⁶.

Catastrophizing

Catastrophizing, a cognitive and emotional response to pain consisting of magnification of the threat of pain, rumination about pain, and helplessness about one's ability to manage pain is associated increased pain intensity, disability and psychological distress, even when controlling for level of physical impairment². Moreover, catastrophizing is one of the most important pre-treatment risk factors that impairs the effectiveness of pain-relieving interventions for MSK pain^{7,8}. Pain catastrophizing also predicts pain intensity, opioid use, physical function, and pain persistence following various surgical procedures including knee and hip replacement and spine surgery⁹.

Social Support

According to the stress-buffering hypothesis, negative consequences of stressors on pain can be buffered by social support (i.e., physical and emotional comfort given by others). Indeed, perceived social support is associated with less pain and better overall functioning among people with chronic MSK pain¹⁰. However, social support can sometimes be problematic. Solicitousness (i.e., excessive concern) in response to pain behaviors can result in increased pain-related disability as it may encourage avoidance of regular activities².

Optimism

Optimism, the tendency to consistently hold positive expectations in the face of uncertainty, is a key mechanism in maintaining active engagement in attempts to accomplish a goal despite adversity. It plays a crucial role in effective coping with pain through the promotion of increased healthy behaviors and decreased unhealthy behaviors that lead to better physical function for those in pain. Indeed, higher optimism is consistently related to lower pain intensity and depression for people with chronic MSK pain⁴.

Pain Acceptance

Pain acceptance, a willingness to experience pain and its associated cognitive and emotional consequences as a means of fostering a greater sense of personal engagement and well-being by not relying on avoidant or control-based coping, frees up cognitive and affective resources from worrying about pain to focus on things that can be changed. Pain acceptance is associated with less catastrophizing; better cognitive, emotional, social, and occupational functioning; and better mental health and quality of life⁴.

Self-efficacy

Self-efficacy, one's belief in the ability to perform a behavior or achieve a desired outcome, is a resilience factor affecting the ability to cope successfully when confronted with challenges. Self-efficacy mediates the relationship between pain and functioning in those with chronic MSK pain whereby greater pain is associated with poorer self-efficacy and thus poorer functioning². However, increased self-efficacy results in less pain-related disability⁸.

Conclusion

The experience of pain is multifactorial and is influenced by an array of biological, psychological and social factors that can be broadly categorized as risk factors and resilience factors. It is vital to consider these when studying, assessing and treating MSK pain.

References

1. Nicholas MK. The biopsychosocial model of pain 40 years on: time for a reappraisal? *Pain*. 2022;10:1097.
2. Meints S, Edwards R. Evaluating psychosocial contributions to chronic pain outcomes. *Prog Neuropsychopharmacol Biol Psychiatry*. 2018;87:168-82.
3. Gerrits MM, van Marwijk HW, van Oppen P, van der Horst H, Penninx BW. Longitudinal association between pain, and depression and anxiety over four years. *J Psychosom Res*. 2015;78(1):64-70.
4. Sturgeon JA, Zautra AJ. Resilience: a new paradigm for adaptation to chronic pain. *Current pain and headache reports*. 2010;14:105-12.
5. Tidmarsh LV, Harrison R, Ravindran D, Matthews SL, Finlay KA. The influence of adverse childhood experiences in pain management: mechanisms, processes, and trauma-informed care. *Frontiers in Pain Research*. 2022;3:923866.
6. Bakhshaie J, Penn TM, Doorley J, Pham TV, Greenberg J, Bannon S, et al. Psychosocial predictors of chronic musculoskeletal pain outcomes and their contextual determinants among Black individuals: a narrative review. *The Journal of Pain*. 2022;23(10):1697-711.
7. Martinez-Calderon J, Jensen MP, Morales-Asencio JM, Luque-Suarez A. Pain catastrophizing and function in individuals with chronic musculoskeletal pain. *The Clinical journal of pain*. 2019;35(3):279-93.
8. Dunn KM, Campbell P, Lewis M, Hill JC, van der Windt DA, Afolabi E, et al. Refinement and validation of a tool for stratifying patients with musculoskeletal pain. *European Journal of Pain*. 2021;25(10):2081-93.
9. Darnall BD. Pain Psychology and Pain Catastrophizing in the Perioperative Setting: A Review of Impacts, Interventions, and Unmet Needs. *Hand Clin*. 2016;32(1):33-9. doi: 10.1016/j.hcl.2015.08.005.
10. Che X, Cash R, Ng SK, Fitzgerald P, Fitzgibbon BM. A systematic review of the processes underlying the main and the buffering effect of social support on the experience of pain. *The Clinical journal of pain*. 2018;34(11):1061-76.

