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Pain-related psychological issues in hand therapy

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ABSTRACT

Study Design: Literature review.
Introduction: Pain is a subjective experience that results from the modulation of nociception conveyed to the brain via the nervous system. Perception of pain takes place when potential or actual noxious stimuli are appraised as threats of injury. This appraisal is influenced by one's cognitions and emotions based on her/his pain-related experiences, which are processed in the forebrain and limbic areas of the brain. Unarguably, patients' psychological factors such as cognitions (eg, pain catastrophizing), emotions (eg, depression), and pain-related behaviors (eg, avoidance) can influence perceived pain intensity, disability, and treatment outcomes. Therefore, hand therapists should address the patient pain experience using a biopsychosocial approach. However, in hand therapy, a biomedical perspective predominates in pain management by focusing solely on tissue healing.
Purpose of the Study: This review aims to raise awareness among hand therapists of the impact of pain-related psychological factors.
Methods and Results: This literature review allowed to describe (1) how the neurophysiological mechanisms of pain can be influenced by various psychological factors, (2) several evidence-based interventions that can be integrated into hand therapy to address these psychological issues, and (3) some approaches of psychotherapy for patients with maladaptive pain experiences.
Discussion and Conclusion: Restoration of sensory and motor functions as well as alleviating pain is at the core of hand therapy. Numerous psychological factors including patients' beliefs, cognitions, and emotions alter their pain experience and may impact on their outcomes. Decoding the biopsychosocial components of the patients' pain is thus essential for hand therapists.

Introduction

Pain in upper limb caused by a musculoskeletal disorder (MSD) is one of the main reasons why patients are referred to hand therapy. Many hand therapists rely on a purely biomedical approach to alleviate pain by focusing solely on the injured or degenerated tissues and helping to restore physical function.[1] Nevertheless, it is well established that the pain experienced by MSD patients can be influenced by psychosocial factors such as the tendency to catastrophize in the face of pain, depression, and social support.[2-8] Furthermore, on a population level, the association between pain intensity and severity of tissue lesion may vary greatly and be absent to weak.[9-13] Therefore, it appears that pain is not a simple function of anatomical insult but involves a complex interrelationship between the biological processes and psychosocial factors.[14-16] Pain is doubtlessly a highly complex phenomenon which involves multiple components and makes it a difficult experience to assess for clinicians. The biopsychosocial model of pain proposed by Gatchel (see Fig. 1)[16,17] is helpful to understand this complex phenomenon. This model differentiates the concepts of pain and nociception where pain is the subjective experience that results from the modulation of the sensory

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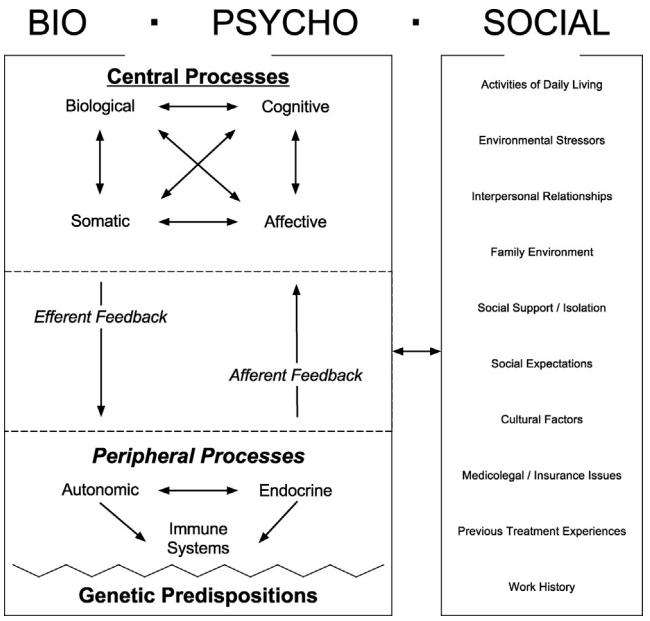

Fig. 1. A conceptual model of the biopsychosocial interactive processes involved in health and illness. From: "Comorbidity of Chronic Mental and Physical Health Conditions: The Biopsychosocial Perspective" by R.J. Gatchel, *American Psychologist*, 2004, 59, 792–805 Copyright 2004 by the American Psychological Association.

information conveyed via the neural processes to the brain, that is, nociception. According to this model, the pain experience is unique for each individual because it is modulated by the reciprocal interactions among biological (eg, genetics, neural processes across the neuraxis), psychological (eg, cognition, emotions, past learning), and social factors (eg, social support, culture).[16,17] Accordingly, understanding patients' pain is capturing how they react to nociception: (a) what the nociceptive information conveyed by the nervous systems means to patients, is it perceived as a serious threat or a manageable situation? (pain cognitions); (b) how patients feel in response to nociception, are they anxious or under control? (pain emotions); and (c) how they behave, do they avoid potentially painful gestures or continue their life as before (pain behaviors)? Thus, when hand therapists face patients' pain, they need to understand the nociceptive origin (biological), and their pain-related thoughts, emotions, and behaviors (psychological), which themselves interact with social factors.[17-20] The use of a biopsychosocial model provides both increased predictive power for the development of chronicity of symptoms.[21-23] Used as a treatment model for MSD, biopsychosocial models are associated with better outcomes than biomedically oriented interventions.[24,25] Indeed, pain management in a biopsychosocial perspective is not only acknowledged as a key feature but also widely recognized as the best treatment approach.[26,27] This can be best done by multidisciplinary teams, as recommended by various pain-expert organizations including the International Association for the Study of Pain.[27-29]

The importance of integrating pain-related psychological factors in hand therapy was highlighted in a special edition of the *Journal of Hand Therapy* (JHT) in 2011.[30] However, the tendency to focus solely on biophysical pain aspects continues to persist. For example, among more than 50 scientific articles published in the JHT between October 2016 and September 2017, only 4 included psychosocial factors as either dependent or independent variables, namely, self-efficacy,[31,32] health literacy,[33] and compliance.[34] Since pain affects hand function[35-38] and is influenced by psychosocial factors,[7] hand therapy without integrating these important dimensions is surely not optimal. There are several reasons why psychological issues are still almost absent from hand therapy. As demonstrated by a recent study investigating attitudes among American orthopedic surgeons, the main barriers for addressing these issues were lack of time, stigma associated with psychological factors, and lack of adequate training.[39] There is good reason to believe that the same is true for hand therapists. However, if the clinicians are convinced of the importance of psychological influences on patients' recovery, they will act on these issues by prioritizing their interventions despite lack of time.

This review, therefore, aims to (1) raise awareness among hand therapists of the impact of pain-related psychological risk factors by reviewing the neurophysiological mechanisms of pain and describing how they can be influenced by various psychological factors, (2) propose several evidence-based interventions that can be integrated into hand therapy to address these psychological issues, and (3) describe some approaches of psychotherapy for patients with maladaptive pain experiences.

Neurophysiological mechanisms of pain

The following section provides a brief review of the neurophysiology of pain (Fig. 2). For more details, the readers are referred to the reviews of Apkarian,[40] Baliki and Apkarian,[15] Basbaum et al,[41] and Bushnell et al.[14]

Peripheral pathways: from the nociceptors to the dorsal horn of the spinal cord

When one's body receives potential tissue-damaging stimuli such as heat or pressure, these noxious stimuli are detected by free nerve endings (nociceptors) that, once converted into nerve impulses, transmit nociceptive information along first-order Aδ- or C-fibers.[42,43] These first-order neurons synapse onto second-order neurons in the dorsal horn of the spinal cord. When tissue damage occurs, inflammatory mediators (eg, tumor necrosis factor-α, nitric

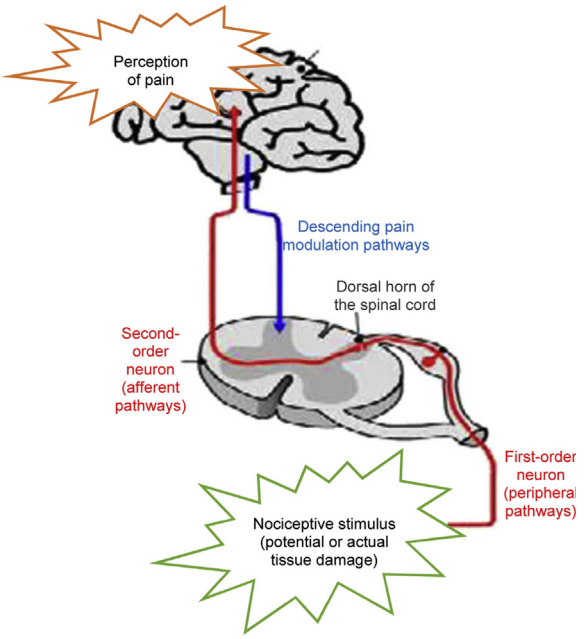

Fig. 2. Peripheral and central pain pathways. Adapted from Nijs J, Van Houdenhove B. From acute musculoskeletal pain to chronic widespread pain and fibromyalgia: application of pain neurophysiology in manual therapy practice. *Manual Therapy.* 2009; 14(1):3–12. Reprint permission obtained from RightsLink®.