Pain-related psychological issues in hand therapy

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\textbf{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.

\textbf{Purpose of the Study:} This review aims to raise awareness among hand therapists of the impact of pain-related psychological factors.

\textbf{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.

\textbf{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.

\section*{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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)\textsuperscript{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 component of nociception.
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. 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, health literacy, and compliance. Since pain affects hand function and is influenced by psychosocial factors, 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. 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, Baliki and Apkarian, Basbaum et al, and Bushnell et al. 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
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