

Original article

Emotional processing and its relationship to chronic low back pain: Results from a case-control study

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ABSTRACT

Chronic low back pain (CLBP) is a common, yet challenging condition for both patients and clinicians. Several studies have demonstrated a strong association between CLBP and psychological factors such as anxiety, fear-avoidance, self-efficacy, catastrophizing and depression. These factors are closely linked with emotional states; however, it is unknown whether CLBP patients process their emotions differently from asymptomatic individuals. The aim of this case-control study was to investigate the relationship between CLBP and emotional processing. A sample of 110 participants comprising of 55 patients with chronic back pain and 55 individuals without a history of CLBP were assessed using the Emotional Processing Scale (EPS-25). The EPS-25 generates an overall score, and also scores pertaining to five individual emotional processing factors – avoidance, suppression, unregulated emotion, impoverished emotional experience and signs of unprocessed emotion.

Chronic back pain patients scored significantly higher in the overall EPS-25 score ($p < 0.001$) with an effect size of 0.33. In addition, there were significant differences in four factors – impoverished emotional experience, unregulated emotion, unprocessed emotion, and suppression, with effect sizes ranging from 0.20 to 0.44. The results suggest that dysfunctional emotional processing, particularly with regard to the suppression of emotions, is associated with CLBP. Clinicians should critically consider the role of emotional processing in their patients' evaluation and management. Future research using a prospective cohort should assess the role of emotional processing as a predictor in the development of chronic back pain.

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1. Introduction

Chronic low back pain (CLBP) is recognised to be a major health and economical problem (Henschke et al., 2010). Current approaches to the treatment of CLBP have limited success (Wand et al., 2011), particularly those based on the biomedical model of care in which pain and tissue damage are considered to be synonymous (Vlaeyen and Crombez, 1999). Indeed, it is well documented that tissue damage is not a prerequisite for the development of CLBP. Several studies have demonstrated a strong association between CLBP and psychological factors such as anxiety (Manchikanti et al., 2002; Pincus et al., 2002), fear-avoidance (Brox et al., 2005), distress/depressive mood (Manchikanti et al., 2002; Pincus et al., 2002), anger (Burns et al., 2006; Carson et al., 2007), and poor coping strategies, particularly where these are related to

low levels of pain self-efficacy (Woby et al., 2005; Costa et al., 2011). Notwithstanding this substantial body of evidence, a comprehensive overview of these factors is lacking because the majority of studies focus on one or a few factors in isolation (Manchikanti et al., 2002; Carson et al., 2007; Foster et al., 2010), or are confounded by the interaction between them (Vlaeyen and Crombez, 1999; Pincus et al., 2002; Meyer et al., 2009).

Arguably, the aforementioned psychological factors can be viewed as expressions of dysfunctional emotional processing. Emotional processing refers to the means by which emotional episodes are assimilated to enable their effect to subside and therefore other experiences and behaviours to occur without disruption (Rachman, 1980). Baker et al. (2007, 2010) have identified five individual factors relating to emotional processing deficits – suppression, signs of unprocessed emotion, unregulated emotion, avoidance, and impoverished emotional experience. We posit that emotional processing deficits are likely to play a role in the development of CLBP. In fact, Walters (1966) proposed that the role of emotional processing could be key to a fuller understanding of the

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psychological factors involved in CLBP. More recently, Baker et al. (2010) have argued that emotions lie at the interface between physical and psychological processes and therefore, impaired emotional processing may be associated with both psychological factors and physical conditions such as CLBP. Despite the plausibility of these arguments, it is currently unknown whether CLBP sufferers process their emotions differently from asymptomatic individuals. An investigation into the role of emotional processing in CLBP is, therefore, warranted.

Our primary objective was to examine the way in which patients with CLBP process their emotions compared to a group of individuals without a history of CLBP, using the Emotional Processing Scale (EPS-25).

2. Method

2.1. Design

We used a case-control design to compare emotional processing of adults with CLBP with age-matched individuals without a history of chronic back pain.

2.2. Participants

A sample of 110 individuals was recruited from the British School of Osteopathy (BSO) and Oxford Brookes University (OBU) outpatient osteopathy clinics and from the student and staff populations at the BSO and OBU between October 2008 and November 2011. The cases ($n = 55$) were drawn from the two clinics as well as members of the student and staff populations. All were over 18 years of age and able to communicate in English, without a history of diagnosed psychopathologies (e.g., depression) in the last 10 years, and with low back pain symptom duration of ≥ 3 months. The participants in the control group ($n = 55$) were students and members of staff at the BSO and OBU able to communicate in English, without a history of diagnosed psychopathologies in the last 10 years, or a history of chronic pain including CLBP in the last 5 years.

2.3. Study measure

The Emotional Processing Scale (EPS-25) was used to compare emotional processing in the case and control groups. Emotional processing deficits are measured by a 10-point visual analogue scale which ranges from 'completely disagree' (0) to 'completely agree' (9). The EPS-25 incorporates statements such as "I tried not to show my feelings to others". There is an emphasis on relating the answers to experiences in the previous week to reduce the possibility of recall error. The EPS-25 generates an overall emotional processing score, and also scores pertaining to five separate emotional processing factors:

- suppression – excess control of emotional experience and expression;
- unprocessed emotion – intrusive and persistent emotional experiences;
- unregulated emotion – inability to control emotions;
- avoidance – avoidance of negative emotional triggers;
- impoverished emotional experience – detached experience of emotions due to poor emotional insight.

These five factors are illustrated in Fig. 1. There is evidence to support the validity and internal reliability of the EPS-25 (Baker et al., 2007; Mehrotra, 2007; Wilkins et al., 2009; Baker et al.,

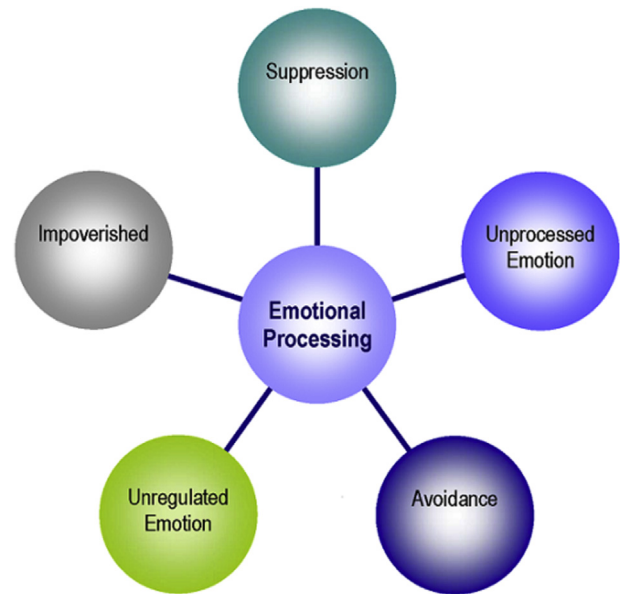


Fig. 1. Dimensions of Emotional Processing Scale.

2011). On this point, Baker et al. (2007) reported that the EPS-25 has a good test–retest reliability ($r = 0.79$; $p = 0.01$).

2.4. Procedure

The study was approved by the BSO Research and Ethics Committee and OBU Research and Ethics Committee and all participants gave their verbal and written informed consent. The setting for the study was the BSO and OBU outpatient osteopathic clinics. Participants were drawn from the two clinics as well as the staff and student populations. They were recruited primarily by a poster campaign; at the BSO an electronic mailshot was also used to recruit controls. Participants who fulfilled the inclusion and exclusion criteria attended the relevant clinic for appointments with the researchers to complete the EPS-25 and to provide biographical data and CLBP details where applicable. Questionnaires were anonymised by reference number allocation. Although the EPS-25 is designed to be psychologically non-invasive and historically there are no reported adverse reactions in participants in studies that used it, precautions were nonetheless taken to minimise the risk of adverse emotional reactions occurring during data collection. To this end, the researchers received training from the developers of the EPS-25 to ensure consistent and sensitive administration of the questionnaire. No participants reported requirement of emotional support during or following completion of the EPS-25.

2.5. Data analysis

Descriptive statistics were computed for demographic data and EPS-25 scores. Median and interquartile range were used to describe the sample in terms of age; mean, standard deviation and 95% confidence intervals were used to describe EPS-25 scores. To examine the null hypothesis "there is no difference in the way people with CLBP process their emotions in comparison to people without CLBP" ($\mu_A - \mu_B = 0$), we used independent t -tests. Differences between EPS-25 factors were analysed using independent t -tests. Cohen's d and effect size correlations for the overall EPS-25 score and EPS-25 factors were calculated using the independent t -test values and the degrees of freedom. Considering the absence of published research investigating the relationship between CLBP

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