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Chronic low back pain and the transdiagnostic process: How do cognitive and emotional dysregulations contribute to the intensity of risk factors and pain?

M. Le Borgne[a,*], A.H. Boudoukha[a], A. Petit[b], Y. Roquelaure[b]

[a] Laboratoire de Psychologie des Pays de la Loire (LPPL, UPRES EA 4638), Chemin de la Censive du Tertre, BP81227, 44312 Nantes Cedex 3, France
[b] Equipe d'Epidémiologie en Santé au Travail et Ergonomie (ESTER, Inserm UMR 1085), UFR Santé Département Médecine, Rue Haute Reculée, 49045 Angers Cedex 01, France

HIGHLIGHTS

- Transdiagnotic approach is an innovative way to understand pain and psychological factors.
- Cognitive and emotional processes are moderator factors.
- Difficulties in emotional regulation play an important role in the increase in negative affects.

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ABSTRACT

Background and aims: Based on a transdiagnostic approach, this study assesses the impact of cognitive and emotional processes (difficulties in emotional regulation, impulsiveness, rumination and somatosensory amplification) on the psychological risk factors of chronic low-back pain.
Methods: The study was carried out with 256 patients with chronic low-back pain. All the variables were assessed through a booklet of 10 validated questionnaires. Multiple regression analysis and moderation analysis were performed.
Results: Predictors included in multiple regression models explain 3%–42% (adjusted R^2) of the variance in psychological risk factors. Moreover, analyses reveal a significant moderator effect of somatosensory amplification on the link between fear-avoidance beliefs linked to work and pain intensity ($F_{(3;250)} = 12.33$; $p = .00$), of somatosensory amplification and brooding on the link between depression and functional repercussions (FR) on everyday life ($F_{(3;252)} = 13.36$; $p = .000$; $F_{(1;252)} = 12.42$; $p = .00$), of the reflection dimension of rumination on the link between the helplessness dimension of catastrophizing and FRs on sociability ($F_{(3;252)} = 37.02$; $p = .00$). There is also a moderation analysis with a significant trend concerning the lack of emotional awareness and the difficulties in controlling impulsive behaviours.
Conclusions: Our results indicate an important role of some dimensions of difficulties in emotional regulation, somatosensory amplification and rumination in the increase in negative affects and dysfunctional beliefs, and in the links between those psychological risk factors and pain/disability.
Implications: This study identifies some cognitive and emotional dysregulations substantially involved in work-related chronic pain. This contribute to put in place psychotherapeutic protocols to tackle these deficits and dysregulations in a relevant way.

1. Introduction

Pain, in an occupational context when it concerns musculoskeletal disorders (such as low back pain), is a particularly important phenomenon in most countries. Low back pain, with a 60–90% incidence in France (6–8% becoming chronic) [1], is growing rapidly and resulting in more sick leave, which can sometimes be prolonged. Traditional biomedical variables cannot fully account for the development of disability: the intensity, or the severity of the pain, being responsible for only 10% of prolonged disability [2]. In fact, this issue of pain and disability is today considered a complex biopsychosocial phenomenon in which different factors interact with each

* Corresponding author.
E-mail address: margaux.le-borgne@univ-nantes.fr (M. Le Borgne).

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other. The question of pain chronicization is of increasing interest to public authorities and the research community due to the significant costs it entails for society, companies and individuals. The aim of research has been to identify the modifiable risk factors, which could form the basis of targeted interventions to prevent the development of prolonged disability [3,4]. However, although studies have identified many psychosocial factors as predictors of chronicization or the development of disability, their prognostic value is low if these factors are taken individually [5]. Thus, researchers now recognize the need for a multidimensional perspective. Moreover, it is now known that psychological, and especially emotional, factors are closely linked with pain. Yet, the treatment of these comorbid factors is in its infancy due to the lack of a clear theoretical understanding of the mechanisms involved in their links [6].

Recently, an emerging approach restarts the debate on the understanding and treatment of psychopathological disorders: the "transdiagnostic" (or "processual") approach [7,8]. This approach postulates that certain psychological processes contribute in a causal way to the development and maintenance of various symptoms observed. Moreover, it allows to account for the phenomenon of comorbidity by showing that different psychopathological disorders can be underpinned by common psychological processes. These different processes can be conceptualized in terms of "vulnerability factors", distinguishing from "risk factors: we can define "risk factors" as a significant set of factors associated with an increased probability of occurrence of a disorder and "vulnerability factors" as a subset of individual endogenous factors that can serve as mechanisms in the development of a disorder. Vulnerability factors moderate the effects of risk factors [9]. Adopting a transdiagnostic approach has many clinical implications in the field of pain [6]: assessing the effect of factors and their interactions will help to understand the link between pain and emotions, improve knowledge about the processes involved and thus strengthen the effectiveness of treatments. Yet, this approach has not been the subject of many studies in chronic pain. It is within this perspective that the aim of this research is to study the impact of cognitive and emotional processes, called vulnerability factors on the psychological risk factors. We choose to study 3 major processes, which are transversal factors in several disorders and are thus conceptualized as transdiagnostic processes [8]: (difficulties in) emotional regulation, somatosensory amplification and rumination. These factors may act as moderators of the relationships between risk factors and pain.

We thus put forward the following hypotheses:

- the levels of vulnerability factors contribute significantly to the increase in levels of risk factors;
- the levels of vulnerability factors moderate significantly the links between risk factors, pain intensity and functional repercussions.

2. Methods

2.1. Participants

This study was carried out within the regional organization offering support and expertise called "Lombaction", part of the occupational diseases consultation department of Angers University Hospital, which aims to reduce the impact of chronic low back pain in the work environment. This organization is aimed at people with an occupational problem (either at work or on sick leave) due to their incapacitating chronic low back pain.

In total, the study sample consisted of 256 subjects, 120 men (46.88%) and 136 women (53.12%), aged from 21 to 61 years, with a mean age of 41.74 (SD = 8.94).

Regarding their occupational status, 219 were employed (92 at work, 113 on sick leave with a recognized occupational disease, 8 working part-time for health reasons) and 37 were not employed (34 without a job, 1 disabled, 2 without a job and with a recognized occupational disease).

Concerning the duration of the low back pain, 25 subjects reported having had back pain for less than 1 year, 107 for between 1 and 5 years and 124 for more than 5 years.

2.2. Material

We compiled a booklet of various validated questionnaires in order to assess:

- Pain:

  Intensity (visual analogue scale): intensity of pain was assessed by a visual analogue scale. This is a tool easy and quick to use which results in a pain intensity score between 0 (no pain) and 10 (maximum pain experienced).

  Functional repercussions (Dallas Pain Questionnaire) [10]: the Dallas questionnaire is a self-administered quality of life questionnaire exploring the functional repercussions of pain in four areas of life ("everyday life activities", "work and leisure", "mood" and "sociability"). Participants responded to the 16 items using a visual scale, segmented to allow for better gradation. The evaluation is done by assigning a value to each segment. Elementary values are summed and multiplied by a constant factor to evaluate the repercussion on each area.
- Risk factors:

  Depression (Beck 13-item Depression Inventory) [11]: The BDI-13 is a 13-items scales that measures intensity of depression. Each item (as "sadness", "suicidal thoughts" or "self-image) includes 4 different proposals that are graded from 0 to 3. The participant choose the one with which he feels most in agreement, depending on how he feels during the last fifteen days. The sum gives an overall score of intensity of depressive syndrome.

  State-anxiety (Spielberger State-Trait Anxiety Inventory) [12]: The STAI-Y, frequently used by researchers and practitioners, examines state and trait anxiety independently. For the state-anxiety scale (Y-A form), participant should refer to what he feels "right now". The Y-A scale comprises 20 items rated on a 4-point Likert scale (1 = almost never, 4 = almost always).

  Catastrophizing (Pain Catastrophizing Scale) [13]: the Pain Cataqtrophizing Scale is one of the most widely used tool for assessing catastrophizing thoughts related to pain. Participants respondend to the 13 items on a 5-points Likert scale (0 = not at all, 4 = all the time). This scale gives a total score of catastrophism and a score for each sub-dimension of this concept: rumination, magnification and helplessness.

  Fear-avoidance beliefs (Fear-Avoidance Beliefs Questionnaire) [14,15]: this is a tool to measure the participant's beliefs about how work and physical activity affect his or her low-back pain. It is composed of 16 items divided into 2 subscales: a scale measuring fear-avoidance beliefs related to physical activity (items 1–5), a scale measuring fear-avoidance beliefs related to work (items 6–16).
- Vulnerability factors:

  Emotional regulation (Difficulties in Emotional Regulation Scale DERS-F) [16]: the DERS-F is an instrument developed to identify difficulties of participants in four domains involved in the regulation of emotions. This scale has 36 items and participants responded to each item on a 5-point Likert scale (1 = almost never, 5 = almost always). Factorial analysis revealed 6 factors: 1) nonacceptance of emotional response, 2) difficulties in adopting goal-oriented behaviours, 3) difficulties in controlling impulsive behaviours, 4) lack of emotional awareness, 5) limited access to

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