

## Mindfulness, functioning and catastrophizing after multidisciplinary pain management for chronic low back pain

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### ABSTRACT

We examined mindfulness in people with chronic low back pain who were attending a multidisciplinary pain management programme. Participants completed questionnaires at baseline ( $n = 116$ ) and after a 3-month cognitive-behaviourally informed multidisciplinary intervention ( $n = 87$ ). Self-reported mindfulness was measured before and after the intervention, and relationships were explored between mindfulness, disability, affect and pain catastrophizing. Mindfulness increased following participation in the intervention, and greater mindfulness was predictive of lower levels of disability, anxiety, depression and catastrophizing, even when pain severity was controlled. Mediator analyses suggested that the relationship between mindfulness and disability was mediated by catastrophizing. It is possible that cognitive-behavioural interventions and processes can affect both catastrophizing and mindfulness.

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## 1. Introduction

Cognitive-behavioural interventions are theoretically robust and cost-effective in reducing disability, distress and psychological morbidity associated with chronic pain [15,27]. Such approaches recognise the influence of thinking styles and emotional coping on adaptation, and they aim to change unhelpful beliefs and catastrophic thoughts. Recent psychotherapy research has questioned the need to change the form of thoughts [21] and has instead emphasised the need to change their function [13], with this latest approach proposing a role for mindfulness enhancing techniques [8,23,26].

Mindfulness involves moment-to-moment attention and observation of external and internal stimuli (eg, thoughts, feelings, bodily sensations) in a nonjudgemental and nonreactive way [1,3,16]. Early studies demonstrated that mindfulness-based interventions offer immediate and long-term benefits for chronic pain populations [16–18], including reductions in somatic and depressive symptoms [9,28,34,44]. Acceptance-based interventions for the treatment of chronic pain incorporate mindfulness enhancing

techniques. A systematic review concluded that although such approaches may not be superior to cognitive-behaviour therapy, they can be good alternatives [40]. Cross-sectional research has begun to examine mindfulness as a state and as a skill, revealing that enhanced self-reported mindfulness is associated with lower distress and disability [24,25].

Some research has addressed the question of how the ability to be mindful may be beneficial. Recent cross-sectional investigation with 104 heterogeneous chronic pain outpatients [33] found lower mindfulness was related to greater catastrophizing. This is consistent with the theoretical premise that catastrophizing is the obverse of mindful awareness. Catastrophizing involves focused attention on painful bodily sensations, and interpretation that they indicate current or potential harm, whereas in mindfulness, all stimuli are monitored without judgement [29]. This finding is important considering evidence that catastrophizing may initiate fear, activity avoidance and subsequent disability and depression [6,41]. We conclude that further exploration is warranted of the relationship between catastrophizing and mindfulness and their individual relationships with disability and distress.

The aim of this study was to determine whether self-reported mindfulness improved after a cognitive-behavioural biopsychosocial intervention for chronic pain. It was predicted that self-reported mindfulness scores would change during the

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intervention given the clinical and empirical premise of lowered catastrophizing after cognitive-behavioural therapy and the previously identified relationship between mindfulness and catastrophizing. Such changes in mindfulness allowed further investigation into whether mindfulness was significantly associated with physical and psychological functioning and catastrophizing across 2 time points.

The second aim was to offer explanation into whether relationships between mindfulness and physical functioning or depression were mediated by catastrophizing. It was hypothesised that the ability to attend to all stimuli in the moment might be useful in counteracting the potential harmful effects of focused attention on pain. It was proposed that increased mindfulness results in reduced catastrophizing with consequent improvements in disability and depression. The context of our study was an outpatient multidisciplinary pain management programme for people with chronic low back pain [42]. The programme aimed to improve patients' quality of life and increase independence through a cognitive-behavioural biopsychosocial intervention that incorporated an introduction to mindfulness session.

## 2. Methods

### 2.1. Participants and procedure

The study comprised both cross-sectional and longitudinal data collection from individuals attending a tertiary multidisciplinary specialist chronic back pain unit in the Midlands of the United Kingdom. Data collection was commenced after approval of the Nottingham 1 Research Ethics Committee and compliance with research governance procedures.

Data collection occurred between January 2008 and March 2009 inclusively, during which period pain management clinical staff issued all participants with questionnaire packs at both the beginning and end of their treatment block. Participants were given information about the questionnaires, which included confidentiality assurances and their ability to withdraw, and the clinical staff member remained available to address any concerns.

Most referrals to the pain management programme originated from a pain clinic or orthopaedic department, with the remainder being from other hospital departments within the same acute-care trust. Patients were accepted if they had had back pain for at least 9 months and their disability was primarily caused by lumbosacral pain (as defined by the patient or assessor). Potential participants from the unit were excluded if: (1) there were pending investigations or treatments, (2) their physical pathology or psychological disorder was most appropriately managed by individual treatment, (3) they were unable to stand from a seated position or walk 5 m without assistance, or (4) they were unwilling or unable to undertake a graded exercise programme. Pain management programme participants attended the Back Pain Unit for 7 hours on one day of each of 9 consecutive weeks (total contact time = 63 hours), in groups of up to 12 participants per programme. Through the programme, participants addressed a variety of issues including mechanisms of chronic pain, anatomy, techniques for goal setting, graded exercise and pacing, stress management, relaxation and imagery, challenging negative thoughts, communication skills and medication usage. Discussions and activities were interspersed with group exercise sessions, workshop sessions and individual meetings with a named worker. Each programme included a single 1-h session introducing mindfulness to participants but did not implement formal mindfulness training.

Participants comprised 116 adults (65 women) with chronic low back pain. Their mean age was 52 (SD 12, range 18–79) years, and 51% (59) had experienced pain for 10 years or more. At the

time of the study 77% were not in paid employment. All of the participants identified themselves as white British except one, who was Asian Indian. Table 1 provides information on participant pain duration.

### 2.2. Measures

Initial demographic information was collected from patients' medical notes comprising data on the following: ethnicity, pain duration (in months), age (in years), gender and employment status. Questionnaire packs comprised robust, well-validated self-report measures assessing pain severity, disability, psychological functioning, pain catastrophizing and mindfulness (presented in this order). Measures were chosen on the basis of past use with chronic pain populations, ease of completion and comparability with similar studies [24,25].

#### 2.2.1. Mindfulness

Mindfulness was measured by the 15-item Mindful Attention Awareness Scale (MAAS) [3], specifically assessing present moment attention and awareness via items that denote mindlessness. Items are rated on a scale from 1 (almost always) to 6 (almost never), with a total score derived from the mean of the item responses; higher scores indicate greater mindfulness. The reliability and validity of the measure has been well established [3], and it has previously been used in an analysis of the role of mindfulness in chronic pain [24,25]. In the present study, Cronbach's coefficient alphas were .89 for time 1 and .85 for time 2.

#### 2.2.2. Pain severity

Pain severity was measured by a specific item within the SF-8 Health Survey, a generic health outcome questionnaire [43]. The item required respondents to rate how much bodily pain they had had during the last week, by marking, 'none,' 'very mild,' 'mild,' 'moderate,' 'severe' or 'very severe.'

#### 2.2.3. Physical disability

Physical disability was measured with the Roland and Morris Disability Questionnaire (RMDQ), which comprises 24 items rated on a dichotomous yes/no scale [32]. These items enquire about impairments in physical functioning attributable to back pain in a range of everyday activities, such as sleeping, walking, eating and undertaking jobs. Higher scores indicate greater levels of disability associated with low back pain. In their original study Roland and Morris identified a score of 14 or more as reflecting poor outcome. The RMDQ has been extensively used in clinical and research domains, with patients with low back pain demonstrating good psychometric properties [32]. In the present study Kuder-Richardson alpha values were .81 for time 1 and .81 for time 2.

#### 2.2.4. Psychological functioning: anxiety and depression

Depression and anxiety were measured with the 14-item Hospital Anxiety and Depression Scale (HADS) [45], originally developed for use with people experiencing physical illness, and thus somatic symptoms of depression that could be caused by physical illness are omitted. Items are rated on a 4-point scale; higher scores indicate greater anxiety or depression. A score of 8 or more reflects probable anxiety or depressive disorder [2]. The scale has good internal consistency and reliability [36]. In a literature review of the validity of the HADS, Cronbach's alpha for the anxiety subscale varied from .68 to .93 (mean .83) and for the depression subscale from .67 to .90 (mean .8 [2]). In the present study, alpha values for the anxiety and depression subscales were .82 and .84, respectively, for time 1 and .83 and .84, respectively, for time 2.

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