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Observational study

Constructs of health belief and disabling distal upper limb pain

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HIGHLIGHTS

- Factor analysis was used to identify health belief constructs specific to arm pain.
- Five underlying health belief constructs were identified.
- 'Beliefs about prognosis' moderated the relationship between pain and disability.

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ABSTRACT

Background: Musculoskeletal pain in the distal upper limb is common and is a cause of disability and healthcare consultation. At the time of presentation individuals reporting similar pain severities may report different levels of related disability. The biopsychosocial model proposes that health beliefs may help explain this difference. The aim of this cross-sectional study was to identify underlying constructs of health belief in those referred to physiotherapy with pain in the distal upper limb and investigate whether these constructs moderated the relationship between pain severity and extent of disability.

Method: Health beliefs were assessed using an instrument included in a questionnaire completed before randomisation to the Arm Pain Trial (ISRCTN79085082). Ordinal responses to statements about health beliefs were used to generate a polychoric correlation matrix. The output from this matrix was then used for Exploratory Factor Analysis to determine underlying constructs. The moderating influence of the identified health belief constructs was then tested using interaction terms in linear regression models.

Results: 476 trial participants contributed data, age range 18–85 (mean 48.8, SD 13.7), 54% female. Five health belief constructs were identified: beliefs about hereditary factors, beliefs about movement and pain, beliefs about locus of control, beliefs about the role of lifecourse/lifestyle factors, and beliefs about prognosis. The only health belief construct found to moderate the pain-disability relationship was beliefs about prognosis, with greater pessimism resulting in higher levels of disability at mild-to-moderate levels of pain severity (B −0.17, 95% CI −0.30, −0.036).

Conclusion: This exploratory cross-sectional study identified five constructs of health belief from responses to a previously used set of statements investigating fear avoidance and illness beliefs in a clinical population with pain in the distal upper limb. Of these constructs, beliefs about prognosis were found to moderate the relationship between pain and disability.

Implications: At the time of referral to physiotherapy it may be beneficial to assess patients' perception of prognosis. For those with higher than expected disability for the presenting level of pain, and pessimism about prognosis, focused reassurance may play an important part in initial consultation. Longitudinal study is required to support the findings from this study and investigate whether a causal relationship exists. Future investigations should confirm the health belief constructs proposed.

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1. Introduction

Musculoskeletal pain in the distal upper limb affects around 1 in 12 adults in the UK annually [1,2] is a cause of disability [1,3] and often leads to healthcare consultation [4]. A recent study of 12,426

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workers across 18 countries reported a one-month prevalence of disabling distal upper limb pain of 14.4% [5]. The complex relationship between pain and disability has been conceptualised through a biopsychosocial model [6,7]. Research has supported the importance of health beliefs in the occurrence and chronicity of disabling low back pain [6], and a recent systematic review has highlighted low self-efficacy and pain-related fear as important mediators of the pathway from low back and neck pain to disability [8]. However, less attention has been given to the role of health beliefs in disabling distal upper limb pain [3]. Given prior characterisation of distinct pain-disability relationships for distal upper limb and low back regions [9], specific health beliefs may be of differential importance according to pain site and related functional demand.

A set of 12 statements, developed by Palmer et al., has been used to examine health beliefs in individuals with upper limb pain [10]. The statements, concerning beliefs about cause, appropriate response and prognostic expectation, were adapted from the Fear Avoidance Belief Questionnaire (FABQ) [11] or developed after exploratory qualitative work and literature review [10,12]. Responses have previously been used as variables in cross-sectional and prospective studies [1,5,13,14]. However, the psychometric properties of the instrument have not been formally assessed and questions regarding underlying construct measurement can be raised. Firstly, the FABQ was originally developed for LBP and, despite adaptation, single statements may reflect beliefs of greater importance to locomotion and whole-body support rather than tasks that require gripping or fine finger movement. Secondly, the previous use of responses to single statements from the set as independent variables and/or groupings of responses based on overlap or hypothesised similarity have not been quantitatively justified. Underlying constructs of health beliefs may therefore not be adequately represented.

The aim of this study was to identify underlying health belief constructs from responses to the Palmer et al. statement set [10] from individuals referred to physiotherapy with pain in the distal upper limb. Additionally, in accordance with a biopsychosocial model of disabling pain, we hypothesised that greater negativity of health belief would moderate the strength of the pain-disability relationship at the time of initial clinical presentation. This may help explain why individuals who present with similar levels of pain severity may report varying degrees of related disability. Identifying potentially modifiable health beliefs specific to the distal upper limb that explain greater levels of disability at the time of presentation could provide viable targets for patient counselling and management. Reducing perceived disability at the time of presentation may assist in preventing poor long-term functional prognosis, reduced quality of life and the concomitant societal burden.

2. Methods

2.1. Participants and procedures

This study used baseline data from the Arm Pain Trial (ISRCTN79085082), a UK-based multi-centre randomised trial that investigated management of distal upper limb pain. Its primary research question asked whether advice to remain active compared to advice to rest during the waiting time for physiotherapy reduced the likelihood of persistent disabling distal upper limb pain. Ethical approval for the trial and secondary analyses was obtained from the UK South Central (Hampshire A) Research Ethics Committee (reference: 11/SC/0107). Potential subjects were identified from physiotherapy out-patient department waiting lists between February 2012 and February 2014 from 14 sites across the UK. Eligible subjects were adults either referred or self-referred for musculoskeletal pain anywhere in the distal upper limb (elbow,

forearm, wrist or hand). Exclusion criteria included pain arising due to fracture, malignancy, systemic inflammatory disease or complex regional pain syndrome. Those involved in legal disputes directly related to the pain were also ineligible. Full trial details are provided elsewhere [15].

2.2. Measures

Data for this study was obtained from questionnaires completed prior to trial randomisation. Demographic factors included participants' sex, age and employment status. Employment status was dichotomised into working in a paid job (full- or part-time) or not.

2.3. Pain

Pain-related questions asked about right- and left-side symptoms over the past seven days separately. Pain severity was measured on an 11-point Numeric Rating Scale (NRS) [16], with subjects asked, "On how many days in the past seven days did you have pain in your right (or left) elbow, forearm, wrist or hand?". If a subject reported bilateral symptoms the highest value was used in analysis. Pain duration was assessed by the question, "When were you last free from any ache or a pain in your elbow, forearm, wrist and hand for at least 24 h?" Responses were dichotomised into pain lasting more than one month or pain lasting one month or less. A body manikin was included in the questionnaire on which subjects shaded the location of their pain. Shaded manikins were scored using transparent templates that divided the body into 35 areas. Subsequent coding, based on Manchester criteria [17], classified pain distribution as regional or widespread (contralateral plus spinal).

2.4. Health beliefs

The questionnaire included the health belief instrument developed by Palmer et al. [10], each statement accompanied by a five-point Likert agreement scale (strongly agree to strongly disagree). Of 12 statements in the set, two that were work-related were excluded as the study population included employed and unemployed participants. An additional question was added to the trial baseline questionnaire: "Do you expect the pain in your elbow(s), forearm(s), wrist(s) or hand(s) to be a problem in 6 months' time?". This question, reflecting the duration of the Arm Pain Trial, was followed by a 'yes' or 'no' option. To facilitate its inclusion in the factor analysis, responses were scaled to the five-point Likert scale by equating 'yes' to 'agree' and 'no' to 'disagree'. Responses to all health belief statements were coded to ensure ordinal comparability such that low scores indicated a positive health belief (1 on the 5-point scale) and high scores indicated a negative health belief (5 on the scale).

2.5. Psychological factors

The Short-Form 12 Health Survey, Version 1 (SF-12v1) and the Modified Somatic Perception Questionnaire (MSPQ) were included in the pre-randomisation questionnaire. The Mental Component Summary (MCS) subscale of the SF-12 was used as a measure of mental health (range 0–100, higher scores indicating better mental health) [18]. Scores on the MSPQ were used as a measure of multiple somatic symptoms (range 0–39, higher scores indicating more somatic symptoms) [19].

2.6. Disability

The modified Disabilities of the Arm, Shoulder and Hand (mDASH) questionnaire was used to assess disabling distal upper

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