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An exploration of the extent and nature of reconceptualisation of pain following pain neurophysiology education: A qualitative study of experiences of people with chronic musculoskeletal pain

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ABSTRACT

Objective: Pain neurophysiology education (PNE), a method of pain education, purports to work by helping patients reconceptualise their pain, shifting from a tissue injury model towards a biopsychosocial understanding related to neural sensitivity. Better understanding of pain reconceptualisation following PNE is needed to improve the delivery of this educational approach to enhance its effectiveness. This study aimed to investigate the extent and nature of reconceptualisation following PNE.

Methods: In a qualitative design, based on Interpretive Phenomenological Analysis, thematic analysis was carried out on individual interviews with 7 adults before and three weeks after receiving PNE at a pain clinic.

Results: Three themes emerged describing variable degrees of reconceptualisation; prior beliefs as facilitators and barriers to reconceptualisation; and the influence of reconceptualisation on clinical benefits of PNE.

Conclusion: The results lend support to claims that reconceptualisation is an important mechanism in PNE and justify further investigation of this phenomenon.

Practical implications: When delivering PNE to patients with chronic pain helping patients to reconceptualise their pain may be key to enhancing the clinical benefits of the intervention. Understanding prior beliefs may be an important step in facilitating reconceptualisation.

1. Introduction

A common problem in pain management is lack of understanding of chronic pain and how it affects people. Pain Neurophysiology Education (PNE) also known as "Explain pain" is a widely used form of patient education, with a distinct emphasis on explaining the neurophysiology involved in order to change patients' core beliefs about their chronic pain [1–3]. PNE is based upon Butler and Moseley's manual "Explain Pain" [1]. PNE is delivered by a trained health professional to individual patients or groups of patients. The educational materials and language use layman terms combined with attractive and engaging freehand drawings and metaphors to assist in communicating complex neurophysiological ideas, which are counterintuitive to traditional ways of viewing pain. PNE can be delivered in isolation but more often it is used as a starting point or component of a broader pain management approach. Emerging evidence suggests that PNE can be effective for pain and function – physical, psychological and social [3–9]. While most studies have focused on changes in these outcomes, less attention has been paid to exploring the mechanisms by which PNE works. This is important because its putative mechanism of effect is a key factor in defining PNE as distinct from other methods of education.

This proposed mechanism is reconceptualisation, defined as the acquisition of a new, less threatening understanding about the nature of one's pain [3,8,10]. Reconceptualisation is a process of becoming aware that pain is not proportional to tissue injury; pain is influenced by psychological and social factors; the longer pain persists the weaker its association with tissue health; and pain is a subconscious warning of danger of tissue damage, regardless of whether the danger is real or not [10].

Claims of reconceptualisation following PNE have been made on the basis of quantitative studies showing improved scores in questionnaires about pain physiology [11–13] and pain-related fear [4,7]. However, these are partial or indirect measures of

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reconceptualistaion. Qualitative investigation enables exploration of reconceptualisation in more depth [14–17].

We have previously observed reconceptualisation to be partial and patchy rather than complete; perceived relevance of the information was important for the patient, and reconceptualisation was more apparent when participants talked about pain in general rather than their own pain [18]. In that study, participants were only interviewed *after* PNE, thus restricting the ability to assess change; and the interview questions drew responses that were more about pain in general rather than the participants' own pain. Therefore, we set out to further assess reconceptualisation with specific reference to the participants' own pain, using interviews before and after PNE.

The aim of this study was to investigate the degree and nature of people's reconceptualisation of their own chronic pain following PNE.

2. Methods

2.1. Design

This was a qualitative study based on Interpretative Phenomenology Analysis (IPA). Given the aims of the study, IPA was deemed appropriate as it seeks to understand how a person makes sense of their experience ("*the lived experience*") of a particular phenomenon [19,20]. Participants underwent semi-structured interviews before and after PNE and the transcripts were analysed thematically within an IPA framework. The inductive nature of IPA allowed a focus on participants' understanding of their pain, in relation to reconceptualisation as defined by Moseley [10] (see Section 1), but was sufficiently flexible to facilitate the emergence and identification of unanticipated topics and themes [20]. IPA recognises that an understanding of participants' experiences is only possible through the analytical lens of the investigator and thus, our findings should not be regarded as fact but rather plausible interpretation that is logically and transparently grounded in the participants' transcripts and can be viewed as a co-construction between the researcher and the participant [21,22].

This study was approved by the East Midlands – Nottingham 2 National Research Ethics Service Committee (REC reference: 13/EM/0369). Written informed consent was obtained before enrolment.

2.2. Setting, recruitment and participants

The setting was a single pain clinic in the NHS. Purposive sampling was used to recruit men and women with a spread of ages (≥18 years), with chronic musculoskeletal pain who had been referred for PNE. The study excluded people whose first language was not English; people who were, at any point, a patient of the interviewer (RK). The study aimed to recruit 12 participants which is in keeping with IPA studies where about 10 participants is the norm [19–21]. Data collection was from September 2013 to August 2014.

2.3. Procedures

Participants were scheduled to take part in two face-to-face semi-structured interviews held in a private area of the pain clinic. One researcher conducted all interviews (RK) and no-one else was present. The first interview was one week before PNE, with the second three weeks after. This gap was chosen to allow participants to digest the information from PNE, and it matched the follow-up time used in the highest quality RCT available to date [7]. In the first interview, the questions focused on what participants felt was causing their pain and how psychosocial factors interacted with their pain (Supplementary material A). In the second interview, participants were asked the same questions, plus questions about changes in their beliefs about their pain. The interviewer took care to specifically ask participants to talk about *their* pain and how the PNE session related to *their* pain, to encourage them to talk about their own specific experiences rather than pain in general. The interviews were audio-recorded and transcribed verbatim by an independent agency.

The PNE session was a 2-h didactic group-lecture based upon the manual "Explain Pain", delivered within routine pain management by an experienced senior physiotherapist (VR).

2.4. Analysis

Initial analysis was carried out by one researcher (RK). Following the guidelines of Osborn and Smith [22], transcripts were read and re-read to get an overall impression of participants' perceptions. Notes were made of potential themes and key statements were identified and coded. Groups of statements were grouped together and categorised. From this, emergent themes were tentatively identified. The themes were then discussed at length and further refined by all members of the research team to produce a coherent account of the meaning and essence of the participants' experiences grounded in their own words.

To enhance credibility, the extent to which findings were compatible with the participants' accounts [23], a second author (CR) read the transcripts to ensure that the themes were logical and rooted in the data. Participants were telephoned to ensure that the interpretations by the researcher were a valid reflection of what they said [22]. To enhance the dependability of the data and reduce the risk of excluding minority views, all voices and viewpoints were recognised, analysed and interpreted. The study is reported using the consolidated criteria for reporting qualitative research (COREQ) [24] and is consistent with qualitative methodological recommendations [25,26].

2.5. Reflexivity

Three of the authors are trained in PNE and have experience of delivering PNE clinically (CR, VR, & RK): two currently do this routinely within the NHS (VR & RK). Each researcher considers that PNE is a useful intervention for patients with persistent pain.

3. Results

Eleven people consented to participate. One withdrew before the first interview without giving a reason. Two withdrew before the second, one giving no reason and the other stating that she was in too much pain to participate. With another participant, the second interview was void as the audio-recorder failed. The characteristics of the seven remaining participants (5 women, 2 men) who provided data for analysis are presented in Table 1.

The interviews lasted for a mean of 32 min (range 15–58 min). Three themes emerged: variable degrees of reconceptualisation; prior beliefs as facilitators and barriers to reconceptualisation; and the influence of reconceptualisation on clinical benefits of PNE.

Table 1
Participant characteristics.

Patient ID	Location of pain	Duration of pain
B	Lower back and legs	26 years
C	Lower back	20 years
E	Lower back and leg pain	11 years
F	Lower back and right thigh pain	2 years
G	Thoracic spine and throat	5 years
J	Complex Regional Pain Syndrome	2 years
K	Neck and shoulder pain	2 years