**Original research**

# Effectiveness of pain education for improving pain related knowledge, attitudes and behaviours in healthcare students and health care professionals: a systematic review protocol

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## Abstract

**Background/Aims:** Chronic pain is a long-term condition and a leading cause of disability worldwide. The training of healthcare professionals is where knowledge and attitudes about pain may be shaped for the future. Pain education and management by health care professionals is recognised as being inadequate. This systematic review investigates the effectiveness of biopsychosocial education in improving healthcare professionals' and students' management of chronic pain. It informs the future delivery of effective pain management education.

**Methods:** Biopsychosocial education randomised controlled trials involving healthcare professionals or students and measuring changes in knowledge or understanding, attitudes and beliefs or management behaviours in pain will be included. Comparison studies will feature usual education control, placebo, or a different type of education.

Two reviewers will apply two screenings and assess for bias. Statistical analysis of data will be undertaken or discussed in narrative and graphic format if necessary.

## Background

Chronic pain is a long-term condition where pain persists beyond expected tissue healing times (International Association for the Study of Pain, (IASP) 1986)). In, 2012 chronic pain affected just under 28 million people in the UK (Fayaz et al, 2016). Low back pain alone is the leading cause of disability worldwide (Hoy et al, 2014). Chronic pain can have a significant impact upon the lives of patients, their families, their workplaces and also upon health care services.

Chronic pain conditions require a biopsychosocial rather than a biomedical model of care (Waddell and Burton, 2001; Woby et al, 2004; National Institute for Health and Care Excellence, 2017). Biomedical management lacks evidence of effectiveness but also has the potential to exacerbate the condition by raising fears and anxiety about potential pathological abnormalities (O'Sullivan et al, 2016; Buchbinder et al, 2018). For example, Webster et al (2013) found that early medical imaging in acute low back pain is of no benefit and can lead to worse outcomes.

Health care professionals often hold negative beliefs about people with chronic pain and view the condition within a biomedical framework (Bishop et al, 2008). These negative attitudes can be observed at the preregistration training stage of the health professionals' career (Loeser and Schatman, 2017). Thus, the preregistration phase is an important point where an individual's understanding of, and beliefs about, pain and people with pain may be shaped for the future. Foster et al (2018) and Buchbinder et al (2018) identify the need for enhanced education of health care professionals to support best practice for low back pain, with the aim of integrating professionals' management of the condition and fostering innovation in practice.

In, 2011 Briggs et al described pain education at undergraduate level for healthcare professionals as 'woefully inadequate'. Briggs et al (2011) identified that the amount of curriculum time dedicated to pain was small, averaging 6 hours across a range of health care professions, with few if any, implementing the preregistration pain curricula proposed by IASP (2009)

There are many recognised biopsychosocially informed pain education approaches for people with chronic pain, such as pain neurophysiology education (Geneen et al, 2015). Pain neurophysiology education uses current neuroscience knowledge to drive conceptual changes about pain and the central nervous system rather than concepts of tissue damage (Moseley and Butler, 2015), with a focus on personalised graded functional improvements. Despite the plethora of different educational approaches for patients, there has been relatively little focus on educational approaches for preregistration health care students (BSc or MSc or other preregistration level) and qualified health care practitioners. Studies such as Strong et al (2003), Watt-Watson et al (2004), and Tauben and Loeser (2013) have assessed the effect of

pain education on students and clinicians; however, these were not controlled studies, so no claims of cause and effect could be made. Other studies have been published that have investigated the effects of pain education on health care students using more robust randomised controlled trial methodology (Colleary et al, 2017; Maguire, 2018. There is a need to systematically review the existing evidence for different pain education approaches to guide educational practice for health care students in this important and rapidly growing field.

The aim of this systematic review is to investigate the effectiveness of biopsychosocially informed pain education to improve the knowledge, beliefs and behaviours of registered healthcare professionals (henceforth referred to as 'clinician') and preregistration healthcare professionals (henceforth referred to as 'student'), towards pain and people with chronic pain.

A preliminary search of systematic reviews revealed that there are no existing reviews on this topic.

## Methods

This study will be guided by Cochrane methodology and reported in keeping with PRISMA guidelines and registered with PROSPERO (systematic review record number, CRD42018082251).

### Criteria for considering studies for this review

Types of studies

Randomised controlled trials will be included. All other types of studies will be excluded. Studies in all languages and modes of delivery (eg distance learning vs lecture delivery) will be included in this study from 1977 to the present date. The term 'biopsychosocial' was coined in 1954 by Roy Grinker (Ghaemi, 2009), who applied it to a psychoanalytic context but in 1977, Engel first applied the term [Engel, 1977] to a medical context hence the reason for choosing 1977 as the start date for the search.

Types of participants

Participants in the studies selected may be students or clinicians. This includes nursing, midwifery, medical, allied health care professionals, chiropractors, pharmacists or any other group who may be involved in the management/treatment of patients with chronic pain. Chronic pain is defined as 'an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage' (International Association for the Study of Pain, 2017).

Types of interventions

The studies may use any type of biopsychosocially informed pain education. The education must be centred on the biopsychosocial model of care in keeping with current best practice guidelines. Examples of these guidelines are Royal College of Nursing Pain Knowledge and Skills Framework for the Nursing Team (2015), The British Pain Society's Guidelines for Pain Management Programmes for Adults (2013) and the National Institute for Health and Care Excellence Guidelines for low back pain without radiculopathy (2017). Educational interventions centred around the biomedical model, focusing on content such as anatomy and biomechanics will not be included.

Studies may include education programmes that have been delivered in a variety of different ways, including but not limited to, face-to-face, online, blended learning, short courses or workshops. The programmes may be delivered either to individuals or a group. The programme can be delivered within a one off session or over a number of sessions. The intervention will specifically target changes in one or all of the following:

- Pain-related knowledge or understanding
- Individuals' attitudes and beliefs regarding people with chronic pain
- Pain management behaviours.

Types of comparison groups

Studies using usual education control, placebo/sham education, no education, or a markedly different type of education from the education delivered as the intervention will be included in this study. Additionally, concomitant studies, those that combine an education with another intervention, will also be included.

Types of outcome measures

This systematic review will include studies that use outcome measures to assess one of three key areas:

- Pain-related knowledge or understanding (eg the pain neurophysiology quiz, Catley et al, 2013)
- Students'/clinicians' attitudes and beliefs regarding people with chronic pain (such as the Health Care Providers' Pain and Impairment Relationship Scale, Houben et al, 2004, Pain Attitude and Beliefs Scale Ostelo et al, 2003 and Fear-Avoidance Belief Questionnaire, Mintken et al, 2010)
- Pain management behaviours (eg management of real patients, patients notes, patient vignettes).

In addition, pain management behaviours may also extend to the outcomes of patients who have received care from a student/clinician who has participated in an educational study in comparison to the outcomes of patients who have received care from a student/clinician who received a control, comparison or sham education. Outcomes that have an established level of reliability and validity will be prioritised. However, given the nature of the constructs being assessed (eg pain management behaviours), non-validated measures will also be considered on a case-by-case basis.

**Primary outcomes**

The primary outcome for this systematic review will be students'/clinicians' attitudes and beliefs regarding people with chronic pain. Evidence shows that attitudes and beliefs directly influence clinicians' behaviour with patients (Gardner, 2017).

**Secondary outcomes**

- Clinicians'/students' knowledge of persistent pain.
- Clinicians'/students' change in clinical practice in persistent pain management, therein assessing the participants' application of the knowledge acquired.
- Changes in patient outcomes of patients directly treated by the clinician/student participant who has participated in pain education.

**Search methods for identification of studies**

Electronic searches

The following databases will be searched: CINAHL, AMED, PEDro, Cochrane Library Online, MEDLINE, ScienceDirect, Rehabdata, SportDiscus, EMBASE, ASSIA and Education Research Complete). Grey literature will also be included primarily via the British Library.

Search filters will be used to identify randomised controlled trials on MEDLINE, EMBASE and CINAHL. Specialist librarian assistance will be engaged to translate filters for other platforms without a recognised filter in keeping with guidance in the Cochrane Handbook for Systematic Reviews for Interventions (Higgins and Green, 2011).

**Search Strategy**

The Population, Intervention, Comparison, Outcomes and Study design strategy used to define the scope of this study is detailed below in *Table 1*: The provisional scoping search revealed that there are previous studies featuring biopsychosocial education for physiotherapists, sports therapy and rehabilitation students, medicks and nurses and the interventions include PNE, biopsychosocial e-learning interventions and cognitive behavioural pain management.

Table 1. Population, Intervention, Comparison, Outcomes and Study design search strategy

| | |
|---|---|
| Population | Physiotherapists |
| | Nurses |
| | Occupational therapists |

| | |
|---|---|
| | Allied health professionals |
| | Doctors |
| | Midwives |
| | Paramedics |
| Intervention | Pain education |
| | Biopsychosocial education |
| Comparison | No criteria |
| Outcome | Evaluation of pain education in knowledge, practice, behaviours, attitudes, beliefs and perceptions |
| Study design | Randomised controlled trials |

Guided by *Table 1*, the following search terms for randomised controlled trials only will be used allowing for variation of medical subject heading descriptors governed by individual databases. All medical subject heading descriptors will be exploded to broaden the data set. Boolean operators will also be used for this purpose as suggested by the Cochrane Handbook for Systematic Reviews for Interventions (Higgins and Green, 2011). For example:

*((‘pain’ AND (‘education’ OR ‘curriculum’ OR ‘continuing professional’ OR ‘training’ OR ‘teaching’ OR ‘cognitive functional’ OR ‘PNE’ OR ‘e-learning’)) AND*

*(‘student’ OR ‘health professionals’ OR ‘nurs*’, OR ‘doctor* OR ‘physiotherap* OR ‘therapist* OR ‘practitioner’ OR ‘medic’ OR ‘midwi* OR ‘paramedic*)*

*AND*

*(‘knowledge’ OR ‘attitudes’ OR ‘beliefs’ OR ‘perceptions’)*

Some databases with more limited interfaces such as PEDro will require slightly different approaches to the search terms used. These will, however, be recorded as they are applied.

All searches will be saved where databases permit this.

**Search other resources**

Bibliographies of all included randomised controlled trials will be hand searched for further relevant sources.

**Data collection and analysis**

Selection of studies

*First screening*

Study titles and abstracts extracted from the electronic and hand searches will be reviewed independently by two review authors and assessed for eligibility using Endnote. Any duplicates will be removed from the list of studies.

*Second screening*

The full text articles will then be reviewed in their entirety to ensure their eligibility. Any studies that do not qualify for eligibility from second screening will be detailed in the table of excluded studies with reasons for their exclusion. A PRISMA flowchart of data management will also be included.

The full text review will be undertaken independently by two reviewers. Disagreements will be resolved by consensus. If consensus cannot be reached, a third reviewer will be used.

**Data extraction and management**

Stage 1

Data will be extracted by two reviewers independently in keeping with the Cochrane Handbook for Systematic Reviews for Interventions (Higgins and Green, 2011). They will also review one another's extraction techniques to ensure uniformity and reproducibility of the methodology and to minimise errors. Data extraction forms will be modified from the Cochrane extraction form, which will be piloted and amended with the consensus of authors to match the data features of this study, as recommended by Cochrane Handbook for Systematic Reviews for Interventions (Higgins and Green, 2011). Data will be extracted on the basis of intervention description (including definition), participants (including the numbers), the length of the intervention, the mode of the intervention, follow-up period/s, the outcome measures used and pre- and post-intervention scores. The data extracted from the studies will be entered into Review Manager 5 (Cochrane Collaboration's own systematic review tool) or its newer successor RevMan Web if it is available.

**Assessment of risk of bias in included studies**

Stage 2

Two reviewers will assess for risk of bias using the Cochrane Collaboration's 13-point tool for assessing risk of bias (Furlan et al, 2015).

Authors will be contacted to clarify any outstanding queries that may stem from the above bias assessment. Any disagreements in risk of bias assessment will be resolved through discussion and if agreement cannot be reached then a 3rd reviewer will be consulted.

**Multiple outcomes and designs**

There are a number of different participants and outcome measures that may be considered in educational intervention studies. Thus a separate analysis will be conducted for each outcome.

**Dealing with missing data**

Authors will be contacted to seek data that may not be published such as attrition rate and standard deviations. Missing data and attrition will be reported in the risk of bias table. If authors are not contactable then this will affect the eligibility of the study and the quality rating will be marked down accordingly.

**Assessment of heterogeneity**

I-squared and Tau-squared statistics will be used to investigate heterogeneity. Sensitivity analysis will be carried out where appropriate to explore potential heterogeneity issues. Sub-group analyses and/or meta-regression may be used to explore heterogeneity. Any data that is not amenable to statistical pooling will be discussed in narrative and graphic (tables and figures) format to aid ease of data comparison and discussion.

**Data synthesis**

Where appropriate, intervention effect sizes will be pooled in a meta-analysis using comprehensive meta-analysis (CMA) software and double data entry will be carried out for all of the results. It is expected that most of the data from the studies included in the review will be effect sizes, expressed either as odds ratios (for categorical data) and/or the mean difference between baseline and follow-up (for continuous data). Pooled effect sizes will be described in weighting using the inverse variance approach. Pooling data will only be undertaken where there are at least five studies to ensure sufficient statistical power (Jackson and Turner, 2017). Where studies do not lend themselves to statistical pooling, they will be presented as a narrative synthesis.

Conflicts of interest

There are no conflicts of interest to declare.

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