



Does adding cognitive-behavioural physiotherapy to exercise improve outcome in patients with chronic neck pain? A randomised controlled trial

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Abstract

Objectives To determine whether adding a physiotherapist-led cognitive-behavioural intervention to an exercise programme improved outcome in patients with chronic neck pain (CNP).

Design Multicentre randomised controlled trial.

Setting Four outpatient physiotherapy departments.

Participants Fifty-seven patients with CNP. Follow-up data were provided by 39 participants [57% of the progressive neck exercise programme (PNEP) group and 79% of the interactive behavioural modification therapy (IBMT) group].

Interventions Twenty-eight subjects were randomised to the PNEP group and 29 subjects were randomised to the IBMT group. IBMT is underpinned by cognitive-behavioural principles, and aims to modify cognitive risk factors through interactive educational sessions, graded exercise and progressive goal setting.

Main outcome measures The main outcome measure was disability, measured by the Northwick Park Questionnaire (NPQ). Secondary outcomes were the Numeric Pain Rating Scale (NPRS), Pain Catastrophising Scale, Tampa Scale for Kinesiophobia (TSK), Chronic Pain Self-efficacy Scale (CPSS) and the Pain Vigilance and Awareness Questionnaire.

Results No significant between-group differences in disability were observed (mean NPQ change: PNEP = -7.2, IBMT = -10.2). However, larger increases in functional self-efficacy (mean CPSS change: PNEP = 1.0, IBMT = 3.2) and greater reductions in pain intensity (mean NPRS change: PNEP = -1.0, IBMT = -2.2; $P < 0.05$) and pain-related fear (mean TSK change: PNEP = 0.2, IBMT = -4.7, $P < 0.05$) were observed with IBMT. Additionally, a significantly greater proportion of participants made clinically meaningful reductions in pain (25% vs 55%, $P < 0.05$) and disability (25% vs 59%, $P < 0.05$) with IBMT.

Conclusions The primary outcome did not support the use of cognitive-behavioural physiotherapy in all patients with CNP. However, superior outcomes were observed for several secondary measures, and IBMT may offer additional benefit in some patients.

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Introduction

Chronic neck pain (CNP) is a common problem in the UK, estimated to affect between 14% and 31% of the adult population [1–3]. Pain is rarely attributable to serious pathology, and it is often not possible to identify a specific cause responsible

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for ongoing symptoms [4]. Patients are frequently referred to physiotherapy to manage their pain [5], and previous studies have demonstrated that exercise-based interventions are effective in reducing pain and disability in patients with CNP [6,7]. However, previous research has also suggested that certain cognitive factors are associated with higher levels of pain and disability [8,9], and poor treatment outcomes [10,11].

Feasibly, treatments that address these cognitive factors may enhance treatment outcome. Previous studies have demonstrated that physiotherapy interventions underpinned by cognitive-behavioural (CB) principles are at least as efficacious as other forms of physiotherapy [12–15]. However, to the authors' knowledge, no previous trials have compared the efficacy of a physiotherapy intervention combining CB principles with a standardised exercise programme. Given that both of these treatments have been shown to be effective in reducing pain and disability, it is feasible that outcomes may be enhanced by combining these treatments. Therefore, the aim of this study was to assess whether the addition of a CB intervention to an exercise programme enhanced treatment outcome in patients with CNP.

Methods

Trial design

This was a multicentre, parallel group, randomised controlled trial comparing two active physiotherapy interventions.

Participants

Eligible participants were patients with non-specific CNP of at least 3 months' duration, fluent in English and who had not received physiotherapy for CNP in the past 3 months. Patients were excluded if they presented with serious pathology (fracture, dislocation, carcinoma or infection), radiculopathy, myelopathy, rheumatological disorder or diagnosed major psychiatric illness.

Study settings

Participants were recruited from four outpatient physiotherapy departments in the Greater Manchester region of the UK. Referrals were from both primary and secondary care. All eligible patients were sent a letter inviting them to participate in the trial. Those who wished to participate were asked to complete a pre-treatment questionnaire and consent form, and return it to the research team. Study participants underwent a standardised assessment. Patients who did not want to participate in the trial received physiotherapy as usual.

Study interventions

Progressive neck exercise programme

A systematic literature review of articles comparing exercise with another intervention or two exercise interventions was performed. Studies that included specific, higher-intensity cervical strength or endurance training regimes tended to report superior outcomes compared with studies employing lower-intensity exercise [6,16–19]. Consequently, the progressive neck exercise programme (PNEP) intervention was developed based around sports medicine principles [20] and the protocol employed by Ylinen *et al.* [6].

Participants completed isometric strengthening exercises of the cervical flexors, extensors and side flexors using rubber resistance bands. Participants also performed upper limb strengthening exercises and cervical stretching exercises. Five low-resistance contractions of the strengthening exercises were performed, followed by 12 repetitions at 75% of maximum capacity. Strengthening exercises were performed three times per week, and stretching exercises were performed on at least 5 days/week [20]. Participants attended four weekly sessions lasting 40 minutes, and the resistance of the band was increased gradually. Additionally, participants received written information explaining that there was no serious cause for their neck pain, and outlining the chronic cycle of pain. Participants were also encouraged to participate in usual activity, but the use of structured, functional goal setting was not permitted.

Interactive behavioural modification therapy

Interactive behavioural modification therapy (IBMT) is underpinned by CB principles and based around interactive educational sessions. IBMT aimed to reduce catastrophising and pain-related fear, and enhance self-efficacy beliefs through challenging unhelpful thoughts, emotions and beliefs. Moreover, participants set structured, progressive goals to return to desired activities that they had ceased to engage in because of their pain. Goals were reviewed weekly, and therapists employed problem-solving techniques to help participants to overcome any difficulties that they had encountered. In addition, the participants completed the same PNEP programme outlined above. The IBMT programme was delivered in small groups, and was based around an IBMT intervention shown to significantly modify cognitive factors and reduce levels of disability in patients with chronic low back pain [21]. Participants in the IBMT group received four weekly sessions, each lasting for approximately 90 minutes.

Treatment fidelity

The study interventions were delivered by different therapists. The IBMT groups were delivered by two therapists experienced in delivering pain management interventions. Seven therapists delivered the PNEP intervention. All participants underwent a half-day training programme to familiarise

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