

# Long-term clinical benefits and costs of an integrated rehabilitation programme compared with outpatient physiotherapy for chronic knee pain

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## Abstract

**Background** Chronic knee pain is a major cause of disability in the elderly. Management guidelines recommend exercise and self-management interventions as effective treatments. The authors previously described a rehabilitation programme integrating exercise and self-management [Enabling Self-management and Coping with Arthritic knee Pain through Exercise (ESCAPE-knee pain)] that produced short-term improvements in pain and physical function, but sustaining these improvements is difficult. Moreover, the programme is untried in clinical environments, where it would ultimately be delivered.

**Objectives** To establish the feasibility of ESCAPE-knee pain and compare its clinical effectiveness and costs with outpatient physiotherapy.

**Design** Pragmatic, randomised controlled trial.

**Setting** Outpatient physiotherapy department and community centre.

**Participants** Sixty-four people with chronic knee pain.

**Interventions** Outpatient physiotherapy compared with ESCAPE-knee pain.

**Outcomes** The primary outcome was physical function assessed using the Western Ontario and McMaster Universities Osteoarthritis Index. Secondary outcomes included pain, objective functional performance, anxiety, depression, exercise-related health beliefs and healthcare utilisation. All outcomes were assessed at baseline and 12 months after completing the interventions (primary endpoint). ANCOVA investigated between-group differences.

**Results** Both groups demonstrated similar improvements in clinical outcomes. Outpatient physiotherapy cost £130 per person and the healthcare utilisation costs of participants over 1 year were £583. The ESCAPE-knee pain programme cost £64 per person and the healthcare utilisation costs of participants over 1 year were £320.

**Conclusions** ESCAPE-knee pain can be delivered as a community-based integrated rehabilitation programme for people with chronic knee pain. Both ESCAPE-knee pain and outpatient physiotherapy produced sustained physical and psychosocial benefits, but ESCAPE-knee pain cost less and was more cost-effective.

Clinical Trial Registration No.: ISRCTN63848242.

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**Keywords:** Knee pain; Exercise-based rehabilitation; Physiotherapy; Functioning; Healthcare costs

## Introduction

Chronic knee pain, often diagnosed as knee osteoarthritis [1], is a significant public health problem [2]. It causes pain and disability, impairs psychosocial function and quality of

life, and places a large socio-economic burden on health services [2–7]. As the incidence and prevalence of chronic joint pain is age related, these problems will increase as the number of elderly people increases.

Evidence-based management guidelines [8–10] advocate exercise and patient education/self-management interventions (SMIs) as effective ways of improving pain and physical function in chronic knee pain. In spite of these guidelines,

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only one-third of people reportedly receive exercise-based rehabilitation, and this is usually in the form of a short one-off course of physiotherapy involving exercise and advice [11,12]. Moreover, therapeutic benefits diminish if people do not continue to exercise regularly, and most patients do not adhere to therapeutic advice following discharge [13–18]. SMIs help people to understand and cope with their problems more effectively, improve adherence to management advice and reduce healthcare utilisation [19–21].

Exercise and SMIs are frequently delivered separately; SMIs explain the benefits of exercise but rarely have a participatory exercise component, while the patient education element of exercise regimens focuses on how to perform exercise. However, the benefits of exercise and SMIs might be enhanced if programmes integrate the physical approach of exercise with the educational approach of SMIs. In addition, self-management skills could improve adherence to regular exercise and sustain the benefits [22]. Unfortunately, most integrated rehabilitation programmes are long, complex and expensive, and consequently have limited clinical application [23,24].

To address these issues, an integrated rehabilitation programme entitled ‘Enabling Self-management and Coping with Arthritic knee Pain through Exercise’ (ESCAPE-knee pain) was devised. This improved physical functioning, pain and other psychosocial variables [25], and was more cost-effective than usual primary care [26]. It included elements that enhance adherence, such as using simple equipment, low intensity, functional exercises that were tailored to address each individual’s needs, the benefits were experienced quickly and it was supplemented with written information [15,27]. Although the benefits of the intervention were sustained 6 months after rehabilitation, there was an overall trend towards decline in outcome variables over time. The programme did not incorporate two features known to promote regular exercise: delivery of the programme in the community, and ongoing support from a healthcare professional to reinforce health messages and remotivate people [15–18,27]. Delivering the programme in the community makes inherent sense as this is the setting where the majority of people with the condition are managed. Whether or not ESCAPE-knee pain would be as effective if delivered by a clinician in the community is unknown, but efficacious interventions (carried out in ideal conditions) are often disappointing when delivered in less controllable conditions that prevail in clinical contexts, and frequently require adaptation to ensure clinical feasibility, practicality and maximise effectiveness.

To make the ESCAPE-knee pain programme clinically applicable and to promote long-term adherence to regular exercise, the programme was shortened slightly, delivered in a community centre, and a review session was introduced 4 months after completion of the programme. This study evaluated the feasibility of delivering this programme, and compared its clinical and cost-effectiveness with outpatient physiotherapy. It was hypothesised that: (1) both interventions would increase physical functioning and reduce pain in

the short term, but ESCAPE-knee pain would sustain these benefits for longer than outpatient physiotherapy; and (2) ESCAPE-knee pain participants would have lower healthcare utilisation.

## Method

The aims, design, conduct and data analysis followed a pre-specified protocol (Clinical Trial Registration No.: ISRCTN63848242) and observed the CONSORT recommendations for reporting non-pharmacological interventions [28] and pragmatic trials [29].

### Design

This pragmatic, randomised controlled trial compared outpatient physiotherapy with an integrated rehabilitation programme that combined exercise, patient education, self-management and coping strategies. Pragmatic trials provide information about the clinical and cost-effectiveness of an intervention compared with usual care in the ‘real-life’ clinical situation, by recruiting a representative population and delivering the interventions in the setting and under the prevailing conditions where a healthcare intervention is usually delivered. Consequently, the findings of pragmatic trials are more useful to clinicians because they generalise to clinical practice better than research trials carried out under ideal conditions [29,30].

### Participants

One hundred and seventy potential participants were identified from two local primary care practices. Broad inclusion criteria were adopted: participants had to be over 50 years of age, and had to have consulted a primary care physician for mild, moderate or severe non-specific knee pain lasting for more than 6 months with no identifiable recent cause; these patients would be diagnosed as having clinical osteoarthritis based on their clinical presentation and history [1,31,32]. No attempt was made to identify specific lesions, but people were excluded if they reported their knee pain emanating from knee trauma within the past year. Other exclusion criteria included: lower limb arthroplasty, physiotherapy for knee pain in the preceding 12 months, intra-articular injections in the preceding 6 months, unstable medical or psychological conditions, unable or unwilling to exercise, unable to walk 100 metres, and insufficient command of English to complete the assessment and undertake the intervention. People were not excluded if they had stable comorbidities common in this age group (e.g. type II diabetes, cardiovascular or respiratory disorders), or back, lower or upper limb pain.

Potential participants were sent a letter outlining the study and inviting them to take part. Those who were willing were screened over the telephone for inclusion and exclusion criteria. Subsequently, those people who were willing and eligible were sent an appointment for a baseline assessment

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