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Review

Clinical and cost effectiveness of nurse-led self-management interventions for patients with copd in primary care: A systematic review

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ABSTRACT

Background and objective: Chronic obstructive pulmonary disease is increasing in prevalence and constitutes a major cause of morbidity and mortality globally. As well as contributing to a significant decline in health status in many patients, this condition creates a considerable burden on healthcare providers. Self-management interventions are frequently implemented in community settings to limit the impact of chronic obstructive pulmonary disease on everyday life of individuals and to manage pressure on health systems. Nurses are the most likely professional group to provide self-management support. This systematic review aims to evaluate the clinical and cost effectiveness of nurse-led self-management for patients with chronic obstructive pulmonary disease in primary care.
Design: A systematic review was conducted to identify randomized controlled studies comparing nurse-led self-management interventions to usual care
Data sources: Seven electronic databases, including British Nursing Index, MEDLINE, CINAHL, AMED, EMBASE, Cochrane Library and NHS Economic Evaluation Database, were searched for relevant studies.
Review methods: The Preferred Reporting Items for Systematic Reviews and Meta-Analyses checklist was used to guide the structure of the review. The relevance of citations was assessed based on inclusion criteria, with full texts retrieved as required to reach a decision. Data extraction was performed independently by two reviewers. The Cochrane risk of bias tool was used to undertake a quality review. A narrative summary method was used to describe review findings.
Results: Twenty-six articles describing 20 randomised controlled trials were included in the analysis. Self-management interventions were heterogeneous, with a variable number of components, level of support, mode of delivery and length of follow up. The review demonstrated that nurse-led self-management programmes may be associated with reductions in anxiety and unscheduled physician visits and increases in self-efficacy, but definitive conclusions could not be reached. Few studies addressed economic outcomes and the diverse perspectives, time frames and settings made comparisons difficult. Evidence on cost-effectiveness was inconclusive.
Conclusions: Some nurse-led self-management programmes in this systematic review produced beneficial effects in terms of reducing unscheduled physician visits, lowering patients' anxiety and increasing self-efficacy, but there is insufficient evidence to reach firm conclusions on the clinical or cost-effectiveness of the interventions. Further research should aim to identify the optimal components of these programmes and to identify those patients most likely to benefit. The inclusion of economic analyses in future studies would facilitate decisions by policy makers on the implementation of self-management interventions.

What is already known about the topic?

- Self-management support by nurses for community based patients with chronic obstructive pulmonary disease (COPD) aims to reduce burdens on individuals and healthcare systems by providing sustainable, effective health care which reduces service utilisation and contributes to improved demand management.

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- Recent systematic reviews on self-management interventions for COPD have not examined the unique contribution of nurses, and have included lay-led programmes and those delivered by other professionals.
- Previous systematic reviews are also limited by the absence of analyses of the cost-effectiveness of these programmes.

What this paper adds

- While studies present mixed results, there is more evidence to suggest positive effect of nurse-led self-management support interventions on self-efficacy, anxiety and unscheduled physician visits than for negative effect.
- Evidence is insufficient for the effectiveness of self-management interventions in improving quality of life and in reducing costs. Further studies which include economic analyses are required for definitive conclusions on the effects of nurse-led self-management programmes.

1. Introduction

Chronic Obstructive pulmonary disease (COPD) is a chronic, disabling lung condition characterised by progressive airflow obstruction. The course of this complex, systemic disease is associated with gradual deterioration, significant comorbidity, day to day fluctuations and repetitive clinical exacerbations as the disease advances (Effing et al., 2007). As well as impacting on the quality of life of patients, carers and families, the disease places an enormous burden on healthcare systems, as it is associated with significant healthcare resource use (Bourbeau, 2014). Although mortality data for COPD has been identified as inaccurate due to under-recognition and under-diagnosis of the disease, COPD is recognised as one of the most important causes of death in most countries and as the third leading cause of death worldwide (Lozano et al., 2012; Global Initiative for Chronic Obstructive Lung Disease, GOLD, 2015).

The World Health Organisation (WHO) estimates that 64 million people suffer from COPD worldwide (WHO, 2008). Prevalence is predicted to rise as a result of past high rates of tobacco use and an ageing population (Lozano et al., 2012; Mathers and Loncar, 2006). COPD is a significant economic burden to global healthcare systems, with exacerbations accounting for the greatest proportion of costs (Fan et al., 2012). In the European Union, annual costs of healthcare and productivity loss due to COPD are estimated at €48.4 billion (Gibson et al., 2013) while in the United States (USA), the total national burden of COPD-attributable costs was recently estimated at $36 billion (Ford et al., 2015).

Self-management programmes have been implemented by health care providers in order to facilitate management of the increasing numbers of patients with COPD and to ease pressure on services and reduce costs (Bolton et al., 2010; Bourbeau and Saad, 2012). A number of definitions of the term 'self-management' exist, though in general programmes aim to teach self-management skills that emphasise disease control through changing health behaviour and increasing self-efficacy, with the goal of improving quality of life, enhancing health status and reducing healthcare utilisation (Nici et al., 2006). For the purposes of this review, self-management will be defined according to Barlow et al. (2002:178) as:

> ... the individual's ability to manage the symptoms, treatment, physical, psychological and psychosocial consequences and lifestyle changes inherent in living with a chronic condition.

Self-management training takes a number of forms and may be individually or group based, delivered by telephone or face-to-face and may be professional or lay-led. Where self-management education is undertaken by health care professionals, nurses are one of the most likely groups to participate in this activity (Coster and Norman, 2009). However, despite the proliferation of clinical trials of self-management interventions, and increase in systematic reviews synthesising evidence from these studies, there have been few attempts to assess the contribution of nurses in delivering these programmes. A recent Cochrane review by Zwerink et al. (2014) included self-management interventions delivered by several different professional groups. Where nursing contribution is addressed (Forbes and White, 2009) reviewers have considered this from a generic chronic disease self-management perspective rather than focusing on disease specific interventions.

Significant variations in outcomes have been identified between patients with different long-term conditions such as diabetes and asthma (Rootmensen et al., 2008). COPD patients with more severe disease may see their illness as terminal, rather than chronic, and may therefore not perceive any benefit in engaging in self-management (Willis et al., 2011). Additionally, there are important differences in the content of programmes, with a greater emphasis on lifestyle components such as smoking and exercise in interventions aimed at COPD patients (Barlow et al., 2002). Taylor et al. (2005) attempted to analyse the effects of self-management interventions delivered by nurses and aimed specifically at patients with COPD in a review that concluded that there was insufficient evidence to support widespread implementation of nurse led managements for COPD. A critique of this study identified a number of limitations, including a failure to describe characteristics of the nurses involved, poorly described and inconsistent interventions and diverse methodology (Morrell and O'Reilly, 2005).

Interventions delivered by health professionals may have the greatest benefits for patients Coster and Norman (2009), although Barlow et al. (2002) found little difference between lay-led and professional led-programmes in terms of effectiveness. There are clear cost implications associated with the use of professionally led programmes, however, indicating a need for further assessment of this approach. In 2009, Coster and Norman identified a lack of attention to economic outcomes in systematic reviews of self-management, and Taylor et al. (2005) did not examine this perspective when analysing nurse led interventions. A review of the literature suggests that a deficit in economic evidence still exists, as the latest Cochrane review by Zwerink et al. (2014) did not examine the cost-effectiveness of these programmes. Scoping searches revealed a number of studies have focused on delivery of self-management interventions since 2005, yet no further attempt has been made to synthesise findings from these studies through a systematic review of nurse-led programmes.

Studies published prior to 2004 were not included in this review as these would have been included in Taylor et al's (2005) review. The principal rationale for evaluating only recent trials is that substantial changes in routine COPD care have been recognised in recent years (Kruis et al., 2014) in response to international and national policy initiatives (i.e Department of Health, 2004; Global Initative for Chronic Obstructive Lung Disease, 2006). These changes in the constituents of usual care make comparisons between early and more contemporary studies problematic. This review aims to address gaps in the evidence, by examining clinical and economic outcomes of self-management studies completed in the last decade. The following objectives are identified:

To synthesise the evidence for the clinical effectiveness of self-management interventions delivered by nurses in the community for patients with COPD, compared with usual care.

To explore whether the nurse-led, community based self-management programmes for patients with COPD reduce health