



## Review article

# Identifying components of self-management interventions that improve health-related quality of life in chronically ill patients: Systematic review and meta-regression analysis



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## ABSTRACT

**Objective:** To quantify diversity in components of self-management interventions and explore which components are associated with improvement in health-related quality of life (HRQoL) in patients with chronic heart failure (CHF), chronic obstructive pulmonary disease (COPD), or type 2 diabetes mellitus (T2DM).

**Methods:** Systematic literature search was conducted from January 1985 through June 2013. Included studies were randomised trials in patients with CHF, COPD, or T2DM, comparing self-management interventions with usual care, and reporting data on disease-specific HRQoL. Data were analysed with weighted random effects linear regression models.

**Results:** 47 trials were included, representing 10,596 patients. Self-management interventions showed great diversity in mode, content, intensity, and duration. Although self-management interventions overall improved HRQoL at 6 and 12 months, meta-regression showed counterintuitive negative effects of standardised training of interventionists (SMD = −0.16, 95% CI: −0.31 to −0.01) and peer interaction (SMD = −0.23, 95% CI: −0.39 to 0.06) on HRQoL at 6 months.

**Conclusion:** Self-management interventions improve HRQoL at 6 and 12 months, but interventions evaluated are highly heterogeneous. No components were identified that favourably affected HRQoL. Standardised training and peer interaction negatively influenced HRQoL, but the underlying mechanism remains unclear.

**Practice implications:** Future research should address process evaluations and study response to self-management on the level of individual patients.

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## 1. Introduction

The rising number of people with a chronic condition [1] has led to increasing enthusiasm for self-management approaches, in which patients are encouraged to take on a primary role in managing the daily care of their chronic condition. Through self-management interventions, patients are equipped with essential skills to actively participate in self-management behaviour and manage their condition successfully [2].

Accumulating evidence in systematic reviews and meta-analyses points to favourable effects of self-management interventions in patients with various chronic conditions, such as arthritis [3], asthma [4], chronic heart failure (CHF) [5], chronic obstructive pulmonary disease (COPD) [6], and type 2 diabetes mellitus (T2DM) [7,8]. However, several systematic reviews reported inconclusive results for one or more outcomes reviewed [4–8]. An explanation for the discrepancies in trial findings may be the large variability amongst self-management interventions delivered: they generally consist of multiple interrelated components, with large differences in content, intensity and mode of delivery, and are therefore considered so-called complex interventions. A crucial question is whether particular components of those complex interventions, often shared by several chronic conditions, may be responsible for eliciting positive effects, i.e. being the active ingredients of the intervention [9].

The majority of the chronically ill patients is faced with one or more comorbid conditions [10]. Furthermore, the large proportions of non-complying and non-responding patients in trials in different chronic conditions [11] suggest that adherence to and uptake of interventions might be applicable to chronic conditions at large and transcend specific conditions. This leads to the expectation that specific components of interventions exert their effects irrespective of the clinical condition a patient is facing. For example, the presumed positive influence of peers for social comparison [12] may enhance self-management skills similarly in patients with various chronic conditions, such as COPD or T2DM. Similarly, the acquisition of problem-solving skills to reduce the impact of a chronic condition on daily living may exert similar positive effects on well-being in patients with T2DM and patients with arthritis.

Despite these considerations, few attempts have been made to systematically study the effect of such components of self-management interventions across chronic conditions. Meta-regression techniques are an appealing approach to address this issue, as they enable an exploration of the heterogeneity in effect sizes [13], particularly for factors that differ across studies, such as specific intervention components [14]. Only two previous meta-regressions have tried to identify essential intervention components in self-management interventions in various chronic conditions [15,16]. One revealed that face-to-face contact with patients was associated with improved physical outcomes

in patients with arthritis, asthma, or T2DM [16], while the other could not identify any intervention component that improved outcomes in patients with T2DM, hypertension, or osteoarthritis [15]. Both studies concluded that the mechanism through which self-management interventions work remained unclear.

Both previous meta-regressions focused on physiological outcomes for their analyses. Although these outcomes are clinically relevant, a crucial outcome for patients living with a chronic condition is health-related quality of life (HRQoL) as it measures the impact of the chronic condition on their daily lives. This notion is recognised as it is increasingly being measured in trials as a (co-) primary outcome, mainly through the use of disease-specific scales [17]. Evaluating success of self-management interventions in terms of improvements in HRQoL therefore seems more appropriate from a patient's perspective.

The aim of this study was to quantify the diversity in components of self-management interventions and explore through a meta-regression which intervention components affect improvements in HRQoL across three major chronic conditions (CHF, COPD, or T2DM). Since the prognosis and management of the three chronic conditions differ, our secondary aim was to study the association of intervention components with improvements in HRQoL for each condition separately.

## 2. Methods

### 2.1. Research design

This study was a systematic review and meta-regression of published studies and adhered to the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) criteria [18].

### 2.2. Literature search

An extensive literature search has been conducted in the electronic databases of PubMed, EMBASE, CENTRAL, PsycINFO and CINAHL from January 1985 through June 2013. MeSH terms and key words in title/abstract used were “chronic heart failure”; “chronic obstructive pulmonary disease”; “diabetes mellitus type 2”; “self-management”; “patient-education”; “randomised controlled trial”; and synonyms (see Appendix Table A.1 in Supplementary material for the complete PubMed search strategy). Reference lists of relevant systematic reviews were hand-searched and experts in the domain were consulted to ensure complete coverage of relevant studies.

### 2.3. Study selection

Initial selection based on title/abstract was conducted by one researcher. The full texts of potentially relevant studies were

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