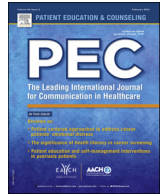




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Improved self-management skills predict improvements in quality of life and depression in patients with chronic disorders

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ABSTRACT

Objective: Self-management programs aim to improve patients' skills to manage their chronic condition in everyday life. Improvement in self-management is assumed to bring about improvements in more distal outcomes, such as quality of life. This study aimed to test the hypothesis that changes in self-reported self-management skills observed after participation in self-management programs predict changes in both quality of life and depressive symptoms three months later.

Methods: Using latent change modeling, the relationship between changes in latent variables over three time points (start and end of rehabilitation, after three months) was analysed. The sample comprised 580 patients with different chronic conditions treated in inpatient rehabilitation clinics. The influence of additional predictor variables (age, sex, perceived social support) and type of disorder as a moderator variable was also tested.

Results: Changes in self-reported self-management skills after rehabilitation predicted changes in both quality of life and depressive symptoms at the end of rehabilitation and the 3 months follow-up. These relationships remained significant after the inclusion of other predictor variables and were similar across disorders.

Conclusion: The findings provide support for the hypothesis that improvements in proximal outcomes of self-management programs may foster improvements in distal outcomes. Further studies should investigate treatment mechanisms.

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1. Introduction

Self-management programs (patient education programs) aimed at helping patients cope with the consequences of their chronic condition are commonly based on the self-management approach [1–3]. Thus, they intend to enhance empowerment of people suffering from chronic illness to take responsibility for the management of their condition in everyday life and make informed decisions concerning medication or lifestyle [1,2,4–6]. In addition, the management of both emotional consequences and role changes may be important. To achieve these ends, patients can use various skills, including self-monitoring, problem solving,

decision making, making use of resources, cooperation with healthcare professionals and action planning [1,4,5,7–11].

Self-management programs are grounded in social-cognitive theory [12] and other self-regulation models (e.g. the model of self-regulation for control of chronic disease [13] or Kanfer's model of self-regulation [14]). These models state that individuals approximate personal goals through continuous reciprocal interaction between person, environment and behavior. The individual observes, evaluates and adapts behavior and chooses appropriate self-management strategies. Thus, the skills to perform these self-management tasks can be regarded as essential outcomes of self-management programs since they are important determinants of health outcomes.

Regarding the aims of self-management programs, proximal and distal goals may be distinguished. Proximal goals are (immediately) targeted by self-management programs and include improvement in knowledge, attitudes and skills. Distal goals are also influenced by other factors outside the self-management program and refer to improvements in more long-term outcomes, such as quality of life or course of disease [3]. It is often assumed that the achievement of proximal goals, i.e. an increase in

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self-management skills, fosters the achievement of distal goals [15]. Effects on proximal goals may be conceived of as necessary, but not sufficient, conditions for effects on distal goals.

The relations between proximal and distal outcomes of self-management programs and especially between self-management skills and quality of life have rarely been studied in a straightforward manner so far. Most studies only report whether there were concurrent effects on proximal and distal outcomes. Reviews of various proximal and distal effects of self-management programs in different chronic diseases showed inconsistent evidence regarding effects in distal outcomes in the presence of effects on proximal outcomes [2,16–23]. Evidence regarding relations between changes in proximal and distal outcomes or mediating effects of proximal on distal outcomes is largely lacking. A review on education programs for prostate cancer reported that few studies showed a mediating effect of self-efficacy [24]. In their review of self-management programs for patients with arthritis, Lorig and Holman [25] concluded that an increase in self-efficacy was correlated with improvements in health status, but there were surprisingly few randomized controlled studies showing relations between behavior and health status. In a review on self-management interventions for patients with chronic musculoskeletal pain, Miles et al. [26] concluded that most studies had a lack of power for studying mediators. A study in patients with chronic obstructive pulmonary disease showed that self-management abilities were associated with quality of life [27]. Another study demonstrated an association between self-management behavior and quality of life in patients with type 2 diabetes mellitus [28]. However, both studies were cross-sectional and did not take change in outcome variables into account. To our knowledge, there are no studies examining the relations between changes in self-management skills and changes in distal outcomes in the context of self-management programs.

Therefore, the purpose of this study was to investigate the relationship between improvement in self-management skills and improvement of quality of life and depression. In particular, our main research question was whether those patients who report an increase in self-management skills during inpatient rehabilitation show a larger subsequent increase in quality of life and a greater decrease in depressive symptoms. We thus hypothesized that the difference of self-reported self-management skills between start and end of inpatient rehabilitation predicts the differences of both quality of life and depressive symptoms between start of inpatient rehabilitation and follow-up three months later, respectively.

An additional research question was whether this relationship between predictors (self-management skills) and outcomes (quality of life, depressive symptoms) remained unchanged after the inclusion of other potential predictor variables, such as age, sex

and perceived social support. Perceived social support may influence coping with stressful situations [29] and has been shown to exert beneficial effects on health [30,31].

Finally, we additionally investigated the effect of type of disorder as a moderator variable: We examined whether the relationships among predictor and outcome variables were similar in different chronic disorders.

2. Methods

2.1. Participants and procedure

These secondary analyses are based on data from the study “Translation and psychometric evaluation of a German version of the Health Education Impact Questionnaire (heiQ™)”, funded by the German Federal Ministry of Education and Research. The study was approved by the ethical review committee of Hannover Medical School (Nr. 5070). Patients from inpatient rehabilitation clinics with different disorders participated in a cohort study. They all received a disease-specific self-management group program as part of their inpatient rehabilitation. They completed a battery of standardized patient-reported questionnaires at the start (T1) and end (T2) of rehabilitation as well as 3 months after completion of the rehabilitation program (T3). Detailed information on this study is presented elsewhere [32]. Participation in the study was voluntary and all participants provided written informed consent. The present analyses are based on a subsample of $n = 580$ patients recruited in five clinics. Condition groups with at least 100 participants were included in this subsample: Rheumatic disorders (rheumatoid arthritis, ankylosing spondylitis, fibromyalgia syndrome), asthma, orthopaedic disorders (chronic back pain) and inflammatory bowel disease.

2.2. Measures

Items from standardized questionnaires were selected as indicators to build latent constructs.

Self-management skills were assessed using the *Skill and technique acquisition* subscale of the German version of the heiQ™ [32,33]. This scale proved to be a reliable and valid measure [32], showing measurement invariance over time and across disorder groups [34,35]. It comprises 4 items with a 1-to-4 Likert response format with higher scores indicating higher skills. It covers the subjective appraisal of skills and techniques that help manage the disease and related problems (item example: “When I have symptoms, I have skills that help me cope”). All 4 items (SM1–SM4) were used as single indicators for self-management skills in the structural equation model.

Table 1
Items of the SF-36 selected for the latent constructs Physical quality of life and Mental quality of life.

Items	Score range
Physical quality of life	
pQL1 “How does your health now limit you in moderate activities, such as moving a table, pushing a vacuum cleaner, bowling or playing golf?”	1–3
pQL2 “During the past 4 weeks have you had any of the following problems with regular activities as a result of your physical health? Were limited in the kind of activities?”	1–2
pQL3 “During the past 4 weeks, how much did pain interfere with your normal work?”	1–5
Mental quality of life	
mQL1 “During the past 4 weeks, were you limited in regular activities as a result of any emotional problems (such as feeling depressed or anxious)? Accomplished less than you would like?”	1–2
mQL2 “How much of the time during the past 4 weeks did you have a lot of energy?”	1–6
mQL3 “How much of the time during the past 4 weeks have you felt downhearted and blue?”	1–6
mQL4 “During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)?”	1–5

Note: Higher scores indicate a higher level of quality of life, except for pQL3 and mQL2, which are reversed with lower scores indicating a higher level of quality of life.

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