



Self Management

Self-management abilities, physical health and depressive symptoms among patients with cardiovascular diseases, chronic obstructive pulmonary disease, and diabetes

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ABSTRACT

Objective: This study aimed to identify the predictive role of direct resources (educational level and marital status) and self-management abilities on physical health and depressive symptoms in patients with cardiovascular diseases (CVD), diabetes, or chronic obstructive pulmonary disease (COPD).

Methods: Our cross-sectional questionnaire-based study included 1570 CVD patients, 917 COPD patients, and 412 patients with diabetes.

Results: Physical health and depressive symptoms of COPD patients was lower than those of CVD and diabetic patients. Correlation analyses indicated that self-management abilities were strong indicators for physical health and depressive symptoms (all $p < 0.001$). This relationship was strongest for depressive symptoms. Self-management abilities were related to educational level in all groups (all $p < 0.001$). Regression analyses revealed that self-management abilities were strong predictors of physical health and depressive symptoms in all three patient groups (all $p < 0.001$).

Conclusion: This research showed that self-management abilities are strong predictors of physical health and depressive symptoms.

Practice implications: Interventions that improve self-management abilities may counteract a decline in physical health and depressive symptoms. Such interventions may be important tools in the prevention of the loss of self-management abilities, because they may motivate people who are not yet experiencing serious problems.

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1. Introduction

Life expectancy is increasing with the ability of modern Western societies to provide high-quality medical and social facilities. As the risk for (multiple) chronic diseases increases with age [1], the number of people with a chronic disease will grow rapidly. Together with this rise in the prevalence of chronic conditions, increasing cutbacks in healthcare pose the difficult task of making all ends meet in society. Increasing self-management abilities of the chronically ill could partially relieve this burden on the healthcare system by allowing patients to better maintain independent and autonomous lifestyles for longer periods of time [2–4].

Most self-management interventions focus on teaching people how to effectively cope with their chronic illness [5–7]. Chronically ill patients need to self-manage their disease on a day-to-day basis

(taking medication, exercise, eating healthy, quit smoking), as a result, day-to-day care constitutes a fundamental part of chronic care, in which self-management abilities of patient are indispensable [4]. In addition to disease related self-management abilities, there may also be a need for interventions aimed at the self-management of overall health and wellbeing to contribute to the (pro)active creation and maintenance of one's own health and wellbeing [8]. A substantial number of chronically ill patients suffer from a mixture of problems in multiple life domains. Therefore, they may benefit more from self-management interventions that provides them with a general cognitive and behavioural repertoire for dealing with different kinds of problems rather than from interventions focusing on disease-related problems only. Successfully dealing with chronic conditions is a long-term process of realising and sustaining health and overall well-being, even in the face of increasing losses and declining gains [2–4,9]. It requires self-care on part of the patient and proactive self-management of resources, which depends on individuals' abilities to self-manage their lives as well as their chronic illness.

The impact of chronic conditions on people's lives is substantial, and it usually affects both physical health as well as depressive symptomatology [10–13]. Individuals' reserve capacities, measured

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by direct resources (education and marital status) and self-management abilities are expected to be important resources to realise and sustain physical health and prevent depressive symptoms [9]. The way in which people manage their conditions often varies by social circumstances and personal experiences [14,15]. Self-management abilities are linked to social class, where those in higher classes are better able to self-manage their chronic condition and more actively care for their chronic condition [14]. In addition, lower educated people often lack the necessary resources to effectively self-manage their condition [15]. Little, however, is known about the relationship between resources, self-management abilities and physical health and depressive symptoms among patients with chronic conditions. Most research focused on disease-related self-management only [5–7], however, there is a lack of research investigating self-management abilities to maintain overall well-being among chronically ill patients. Additionally, it remains unknown whether the relationship between direct resources, self-management abilities and physical health and depressive symptoms differs across chronic conditions. Therefore, this study aimed to identify the predictive role of direct resources and self-management abilities on physical health and depressive symptoms among three patient populations: patients with cardiovascular diseases (CVD), those with diabetes, and patients with chronic obstructive pulmonary disease (COPD).

2. Methods

2.1. Study population

Our cross-sectional study included 1570 CVD patients (established CVD and patients at risk), 917 COPD patients, and 412 patients with diabetes (total: 2899/5271 patients; 55% response rate). These patients were selected by the healthcare practices and were just recently enrolled in newly implemented disease-management programmes and received primary care at one of 120 healthcare practices in various regions in The Netherlands. In most cases questionnaires were mailed to patients' homes. In some cases professionals working in these practices distributed the questionnaires personally during consults. Since not all patients were seen by professionals within a short period of time, this prompted us to change our strategy. Later all patients received a questionnaire at home *via* mail. A few weeks later, a reminder notice and another copy of the questionnaire were sent to non-respondents.

2.2. Measures

We measured self-management abilities by combining three five-item subscales of the Self-Management Ability Scale (SMAS) [16]. Examples of self-management abilities are: the ability to invest in resources for long-term benefits, the ability to self-efficaciously manage resources and the ability to take initiatives. The self-management ability 'being self-efficacious' refers to the ability to gain and maintain a belief in personal competence to

achieve well-being. The higher a person's self-efficacy beliefs are, the more likely that person will, indeed, undertake the activities and efforts needed to maintain or improve well-being. The self-management ability 'taking the initiative' refers to the ability to be instrumental or self-motivating to realise well-being. The self-management ability 'investment behaviour,' is important for achieving stability in resources and thus for the maintenance of well-being in the long run. Without investment behaviour there will be a (stronger) decline in resources and well-being [8,16]. The scale's internal consistency was 0.92. Average self-management ability scores ranged from 1 to 6, with higher scores indicating higher self-management abilities.

The measurement of physical health was performed using the physical component of the Short Form 36 Health Survey (SF-36). Rules for item scoring and scales are available in the SF-36 scoring manual [17]. All scales were transformed to values between 0 and 100 to allow comparison among patient groups. Higher scores indicate more positive ratings. According to the scoring rules, selected items and weights derived from the general Dutch population [18] were then used to score the physical components of physical health.

We used the 7-item depression section of the Hospital Anxiety and Depression Scale (HADS) to assess symptoms of depression in CVD, COPD and diabetic patients. All items were rated on a 4-point scale (0–3). Higher scores mean higher depressive symptomatology. This instrument has increasingly been used in inpatient, outpatient, and primary care contexts, as well as among the general population [19–21]. The questionnaire has shown internal consistency, effective identification of depression, and concurrent validity for the screening of depression. The Cronbach's alpha of 7-item depression section of the HADS scale in our study was 0.82.

Education was assessed on six levels ranging from (1) no school or some primary education (7 years of education or less) to (6) university degree (18 years of education or more). Since financing is not a problem in the Dutch health system to self-manage a chronic condition we did not assess the financial status of respondents.

2.3. Analysis

Descriptive analysis included the calculation of means and standard deviations. After calculating bivariate correlations, multiple regression analyses were performed to reveal predictors of physical health and depressive symptoms among patient populations. All statistical analyses were conducted with SPSS software (ver. 17.0; SPSS, Inc., Chicago, IL, USA).

3. Results

Table 1 displays the characteristics of the study sample. The mean age of COPD patients was higher than those of CVD and diabetic patients (66.11 vs. 63.99 and 64.59). About half of the respondents were men and the majority were married. The proportion of married respondents was higher among CVD

Table 1
Patient characteristics, expressed as percentages or means (standard deviations).

	CVD patients (n = 1570)	COPD patients (n = 917)	Diabetic patients (n = 412)
Age	63.99 (10.19)	66.11 (10.57)	64.59 (10.19)
Gender (female)	48%	47%	44%
Marital status (married)	74%	67%	70%
Educational level (1–6)	2.46 (1.74)	1.92 (1.58)	2.92 (1.83)
Self-management abilities	4.29 (0.76)	4.24 (0.83)	4.32 (0.78)
Physical health	42.82 (10.47)	39.07 (10.16)	42.80 (10.46)
Depressive symptoms	4.27 (3.63)	5.23 (4.11)	3.83 (3.56)

CVD, cardiovascular diseases; COPD, chronic obstructive pulmonary disease.

Table 2

Correlations among patients' background characteristics, self-management abilities, and physical health and depressive symptoms.

	1.	2.	3.	4.	5.	6.
CVD patients (n = 1570)						
1. Age						
2. Female	−0.086***					
3. Married	−0.143***	−0.142***				
4. Education	−0.148***	−0.224***	0.062*			
5. Self-management abilities	−0.085***	0.091***	0.063*		0.212***	
6. Physical health	−0.208***	−0.162***	0.139***	0.214***	0.272***	
7. Depressive symptoms	0.078**	0.066*	−0.138***	−0.226***	−0.503***	−0.438***
COPD patients (n = 917)						
1. Age						
2. Female	−0.185***					
3. Married	−0.027	−0.195***				
4. Education	−0.158***	−0.116***	0.011			
5. Self-management abilities	−0.057	0.074*	−0.011	0.168***		
6. Physical health	−0.138***	−0.120***	0.054	0.232***	0.249***	
7. Depressive symptoms	−0.018	0.048	−0.070*	−0.209***	−0.559***	−0.380***
Diabetic patients (n = 412)						
1. Age						
2. Female	−0.027					
3. Married	0.022	−0.258***				
4. Education	0.019	−0.262***	0.075			
5. Self-management abilities	−0.019	0.019	0.058	0.192***		
6. Physical health	−0.149**	−0.221***	0.094	0.257***	0.211***	
7. Depressive symptoms	0.015	0.146**	−0.112*	−0.196***	−0.500***	−0.403***

CVD, cardiovascular diseases; COPD, chronic obstructive pulmonary disease.

* $p \leq 0.05$ (two-tailed).** $p \leq 0.01$ (two-tailed).*** $p \leq 0.001$ (two-tailed).**Table 3**Predictors of physical health assessed by multiple regression analyses (β).

	CVD patients (n = 1570)	COPD patients (n = 917)	Diabetic patients (n = 412)
Marital status (married)	0.065*	0.033	0.041
Age	−0.186***	−0.123***	−0.178***
Gender (female)	−0.171***	−0.130***	−0.190***
Educational level (1–6)	0.095***	0.153***	0.179***
Self-management abilities	0.243***	0.222***	0.177***
Adjusted R^2	15.6%	11.9%	15.2%
F-value	50.198	21.481	14.166

CVD, cardiovascular diseases; COPD, chronic obstructive pulmonary disease.

* $p \leq 0.05$ (two-tailed).*** $p \leq 0.001$ (two-tailed).

patients than among COPD patients (74% vs. 67%). The mean educational level of COPD patients (1.92) was substantially lower than those of CVD (2.46) and diabetic (2.92) patients. Physical health of COPD patients (39.07) was also lower than that of CVD (42.82) and diabetic (42.80) patients. Additionally, COPD patients reported having more depressive symptoms (5.23) than CVD patients (4.27) and patients with diabetes (3.83). The self-management abilities of patients in all groups were similar.

Correlations of direct resources, self-management abilities, and physical health and depressive symptoms are displayed in Table 2. These results indicate that self-management abilities were strong indicators for physical health and depressive symptoms in all patient groups. Chronically ill patients with higher levels of self-management abilities reported better physical health outcomes and lower depressive symptomatology. This relationship was strongest for depressive symptomatology in all groups. Self-management abilities were related to educational level in all groups. Higher educated chronically ill patients reported higher levels of self-management abilities.

Table 3 displays the results of the multiple regression analysis with physical health as the dependent variable. The results indicate that background characteristics (age and gender), direct resource (education) and self-management abilities were predictors of

physical health in all three patient groups. Higher age and being female are negatively related to physical health, whereas higher levels of self-management abilities and higher educational level are positively related to physical health. Only a weak positive relationship was found between the direct resource of being married and physical health in CVD patients. After controlling for the effects of background characteristics and direct resources, self-management abilities remained strong predictors of physical health (all $p < 0.001$). In CVD and COPD patients, self-management abilities were the strongest predictors of physical health.

Table 4 displays the results of the multiple regression analysis with depressive symptomatology as the dependent variable. These results reveal that self-management abilities were the strongest predictors of depressive symptoms in all three patient groups, even after controlling for the effects of direct resources and background characteristics (all $p < 0.001$). Higher levels of self-management abilities are related to patients having less depressive symptoms. Regarding the direct resources (education and marital status) results indicate that marital status was not a predictor of physical health, but did predict depressive symptoms in CVD and COPD patients. Chronically ill patients who are married reported less depressive symptoms compared to single patients. Educational level was identified as an important predictor of depressive

Table 4Predictors of depressive symptoms assessed by multiple regression analyses (β).

	CVD patients (n = 1570)	COPD patients (n = 917)	Diabetic patients (n = 412)
Marital status (married)	−0.089***	−0.067*	−0.047
Age	0.016	−0.061*	0.012
Gender (female)	0.076**	0.050	0.125**
Educational level (1–6)	−0.099***	−0.121***	−0.067
Self-management abilities	−0.482***	−0.546***	−0.486***
Adjusted R ²	28.1%	33.5%	27.0%
F-value	109.212	80.980	28.742

CVD, cardiovascular diseases; COPD, chronic obstructive pulmonary disease.

* $p \leq 0.05$ (two-tailed).** $p \leq 0.01$ (two-tailed).*** $p \leq 0.001$ (two-tailed).

symptoms in CVD and COPD patients. Chronically ill patients with higher educational levels report having fewer depressive symptoms. The explained variance of the regression models was higher for depressive symptoms than for physical health.

4. Discussion and conclusions

4.1. Discussion

It is increasingly acknowledged that successfully dealing with chronic conditions and coping with the substantial impacts of chronic conditions on people's lives, depends not only on having the 'right' genes, but also on the way in which individuals actively manage their own disease [10–13,22]. Our research showed that self-management abilities were important predictors of physical health and depressive symptoms among patients with CVD, COPD, and diabetes, even after controlling for the effects of direct resources.

In our study, COPD patients reported the lowest levels of physical health and depressive symptoms. Moreover, these patients had the lowest mean educational level in our sample and lower self-management abilities than other groups. Interventions that aim to enhance self-management abilities are thus particularly important for patients with COPD, since they experience greater physical health losses and are dealing with greater depressive symptoms. Such interventions may also need to differ among patients with different educational levels; it may be easier for more highly educated patients to self-manage their disease compared with less-educated patients. Earlier research, for example, showed that self-management abilities are strongly linked to social class, where those in higher classes are better able to self-manage their chronic condition and more actively care for their chronic condition [14]. Lower educated people often lack the necessary resources to effectively self-manage their condition [15]. Therefore, especially in COPD patients, who are less educated, educational levels should be acknowledged when designing self-management interventions.

Interventions that aim to enhance self-management abilities may provide a useful addition to more traditional gerontological and medical interventions, which focus solely on the physical decline associated with ageing and chronic conditions. Examples of self-management interventions for chronically ill patients are education on lifestyle, regulatory skills, and proactive coping. But the patient's own abilities to self-manage their social lives and activities, like regularly socializing with family and friends and being physically active, must also be addressed. This study has shown that chronically ill patients may benefit from interventions that enhance a broad repertoire of self-management abilities. Historically, the medical community has focused on acute care and short-term goals that emphasise the management of acute

exacerbations and complications and the reduction of recovery time. This 'acute care model' has placed the bulk of responsibility for problem solving on the clinician and that for daily chronic-care management on the patient and his/her family. Self-management support is typically lacking within this system. The importance of non-medical interventions, such as smoking cessation and physical activity enhancement, has been underscored by the recent publication of 20-year follow-up data [23–25] showing that daily exercise improved physical health, and reduced hospitalisation and mortality by 30–40%. But even within chronic care, most interventions are usually based on individualistic approaches ignoring the social context of illness [26,27], running the risk of victim blaming [28]. Since, the way in which people manage their conditions often varies by social circumstances and personal experiences [14,15], Greenhalgh [29] argues that it is time to move beyond such individualistic approaches to more holistic models that include a person's family, social and environmental context. Our finding that self-management abilities are associated with educational levels supports this notion. Such a sociological approach may help to contextualize the actions of chronically ill and increase our understanding of the mechanisms of engaging patients in self-care and enhancing self-management abilities in successfully dealing with chronic conditions and coping with the substantial impacts of chronic conditions on people's lives [14,30].

The limitations of this study should be considered when interpreting the findings. First, all patients were just recently enrolled in newly implemented disease-management programmes. Although these are baseline measures only, these patients are likely to receive better care than usual. Requirements of the national programme that provided funding were that the practices had to have some experience with the delivery of chronic care and were equipped to implement all systems needed for the delivery of sufficient chronic care. Therefore, these healthcare practices can be considered to be among the leaders of chronic care delivery in the Netherlands. Second, multiple modes of data collection may be a potential limitation of our study. However, in most cases questionnaires were mailed to patient's homes. Since the majority was sent *via* mail this limitation is however limited. Third, the data collected were cross-sectional; as a result, causal relationships could not be inferred. The strength of this study is the reasonably large sample of CVD, COPD, and diabetic patients in primary care practices. While our study showed that self-management abilities were important predictors of physical health and depressive symptoms, we did not investigate whether interventions aimed to enhance self-management abilities leads to improved physical health and less depressive symptoms. Further research is necessary to establish a causal relationship between self-management abilities and physical health and depressive symptoms, and to explore ways in which the self-management abilities of CVD, COPD, and diabetic patients can be improved.

4.2. Conclusions

This research showed that self-management abilities are strong predictors of physical health and depressive symptoms. The strength of the relationship is strongest for depressive symptoms in all three patient populations. Furthermore, higher educated and female patients are better self managers.

4.3. Practice implications

Interventions that improve patients' abilities to self-manage daily life may counteract a decline in physical health and prevent development of depressive symptoms among chronically ill patients. Examples of self-management interventions for chronically ill patients are patient education on lifestyle, motivational interviewing, regulatory skills, and proactive coping [31,32]. But the patient's own abilities to self-manage their social lives and activities, like regularly socializing with family and friends and being physically active, must also be addressed. This study has shown that chronically ill patients may benefit from interventions that enhance a broad repertoire of self-management abilities. Such interventions may provide a useful addition to traditional interventions, which focus solely on the physical decline associated with chronic conditions. Moreover, such interventions may be important tools in the prevention of the loss of self-management abilities, because they may motivate patients who are not yet experiencing serious problems. Special attention and tailored intervention may be needed for vulnerable groups, such as lower educated, male COPD patients, who report worse physical health outcomes and more depressive symptoms and lower levels of self-management abilities.

Ethics approval

The study was approved by the ethics committee of the Erasmus University Medical Centre of Rotterdam and informed consent was obtained from all participants.

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