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## Self-management for chronically ill older people

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# 6

## **The effect of a self-management intervention on health care utilization in a sample of chronically ill older people in the Netherlands**

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## **Abstract**

### **Background and Aims**

The combination of an increasing number of chronically ill patients and increasing cutbacks in health care will result in a growing burden on the Dutch health care system. The Chronic Disease Self-Management Program (CDSMP) has been found to have a positive effect on health care utilization in the USA. The aim of the present study was to evaluate the effect of the CDSMP on health care utilization among chronically ill older people in the Netherlands.

### **Methods**

129 people aged 59 or older, with a lung disease, a heart disease, diabetes, or arthritis were randomly assigned to an intervention group (CDSMP) or a control group (care-as-usual). We collected demographic data and data on health care utilization (visits to a general practitioner, visits to a medical specialist, total visits to a physician, visits to a physical therapist, visits to a social worker, help from home care, help from unpaid volunteers, admission to hospital or to other institution).

### **Results**

A significant difference was found between the intervention and the control group with regard to home care utilization, but this effect could not be attributed to the intervention. No differences were found between the intervention and control group with regard to use of the other health services.

### **Conclusions**

In this study we found no convincing evidence for a decrease in health care utilization as a result of the CDSMP. More research is needed to investigate more thoroughly the long-term effectiveness of the CDSMP in decreasing health care utilization in the Netherlands.

## 6.1 Introduction

In the Netherlands, 42% of the health care budget is spent on patients who are 65 years of age and older [1]. Older people are often confronted with one or more chronic diseases (i.e., comorbidity; [2]). In 2002, people aged 65 years and older in the Netherlands had, on average, 1.48 diseases [3], comorbidity being associated with an increase in both the costs and the utilization of health services [1;2]. Since the Dutch population is aging, the number of chronically ill patients will also increase, and this, in combination with increasing cut-backs in health care, will result in a growing burden on the health care system [4].

Recently, the role of the chronically ill patient has been changing from a passive, care-receiving role, to a more active, self-regulating role. In this development, self-management programs play an important role, and from the literature it becomes clear that such programs can reduce health care utilization [5-17]. Multiple studies of self-management programs have demonstrated a significant reduction in visits to physicians [5-11;16;17], visits to a clinic [12], visits to hospital emergency departments [13;17], number of hospital admissions [11;17;18], duration of hospitalization [11], and total ambulatory visits [14;15].

One of the self-management programs that has been found to have a positive effect on health care utilization is the Chronic Disease Self-Management Program (CDSMP; [18-20]). In a study carried out by Lorig et al. the treatment group had fewer hospital admissions and spent fewer nights in hospital [18]. In other studies carried out by Lorig et al., the participants made significantly fewer visits to physicians and to emergency departments, during the one and two-year follow-up periods [19;20]. A Chinese study of the CDSMP also showed a significant reduction in the number of hospital admissions, and a study of the CDSMP among Hispanic patients showed a significant reduction in visits to an emergency department [21;22]. Although the above-mentioned studies show significant effects of the CDSMP on health care utilization, these effects were not consistently found in all studies of the CDSMP.

The effect of the CDSMP on health care utilization had already been evaluated in the United States and in China, but not in the Netherlands. Therefore, the aim of the present study was to evaluate the effect of the CDSMP on health care utilization among chronically ill older people in the Netherlands. Knowing from previous studies that the CDSMP can have positive effects on health care utilization, i.e., a decrease in health care utilization, we expected to find at least some effects in our sample of patients aged 59 or older with one or more chronic diseases.

## 6.2 Methods

The procedures, research risks, and associated safeguards for this study were approved by the Independent Review Board of the University Medical Center Groningen.

### 6.2.1 Subjects

In the period between May 2003 and May 2004, patients attending the Internal Medicine outpatient clinic at the University Medical Center in Groningen were personally invited to participate in the study. Participants were also recruited through announcements in the media and in the magazines of various patient associations. Eligibility criteria were: age 59 or older; angina pectoris or heart failure, COPD or asthma, or arthritis, or diabetes; ability to communicate adequately in Dutch; availability to attend a six-week course. Patients with a life-expectancy of less than one year, or already attending a disease-specific self-management program, or participating in another study, or who were permanent residents of a nursing home were excluded from the study. Patients with diseases in addition to a heart disease, lung disease, arthritis, or diabetes were also eligible for participation.

Informed consent was obtained from patients who were eligible and willing to participate in the study. Each time informed consent was obtained from twenty-five patients they were sent a baseline questionnaire, which took about four months. After the patients returned the questionnaire, they were randomized: within each diagnostic group, i.e., disease group, the participants were assigned either to the intervention group or the control group. In this way, six consecutive blocks of about twenty-five people with various diseases were formed during the inclusion period, with equal numbers in the intervention group and the control group. The intervention group received the CDSMP, and the control group received care-as-usual. After the last measurement, the control group also received the patient book that was used in the intervention.

### 6.2.2 Intervention

The program consisted of 6 weekly sessions, each with a duration of 2½ hours, at the University Medical Center in Groningen. There were 10-13 participants in each training group, with two leaders who adhered to a detailed manual [23]. For practical reasons, and because a study carried out by Lorig et al. showed that there were hardly any differences between lay-taught and professional-taught courses [24], all courses were led by the primary investigator (HE), who is an

MA psychologist and educated as a CDSMP Master Trainer at Stanford University, and a peer leader or other Master Trainer (psychologist, PhD). The program is based on the self-efficacy theory [25]. Self-efficacy refers to people's beliefs in their abilities to adopt specific behavior, which is a key factor in behavior change and health functioning [26]. The program incorporates strategies to enhance self-efficacy: weekly action-planning and feedback, participants modeling behavior and problem-solving for each other, re-interpretation of symptoms, group problem-solving, and individual decision-making [18]. The program includes: exercise; cognitive symptom-management techniques; information on nutrition; fatigue-management; use of medication; managing emotions; communication; problem-solving; decision-making [27]. The participants received a Dutch translation of "Living a Healthy Life with Chronic Conditions", a patient book that is used in the program, and can also be used by patients as a reference book [28]. In the translation of the course manual and the patient book, only a few minor cultural adjustments were made, namely with regard to advance directives.

### *6.2.3 Measures*

Data were collected through self-administered questionnaires that were mailed to the patients three weeks before the course started (T0), immediately after the course had finished (T1), and six months after the end of a course (T2). The data included gender and age, marital status and primary condition.

*Health care utilization.* The Lorig et al. "Medical Care" questionnaire [29] was used for the measurement of health care utilization, supplemented with questions from Bos et al. [30]. In the questionnaire of Lorig et al., the participants were asked how many times in the past six months they had visited one or more physicians, and the emergency department of a hospital. They were also asked whether they had been admitted to a hospital, and, if so, how many days they had been hospitalized. In the Bos et al. questions that were included they were asked how many times in the past six months they had visited a general practitioner (GP), a medical specialist, a physical therapist, or a social worker. They were also asked how many times in the past six months they had received home care or help from unpaid volunteers. In addition, the participants were asked if they had been admitted to any other institution, apart from a hospital (i.e., nursing home, rehabilitation center, psychiatric hospital, or any other institution), and for how many days they had been admitted.

#### *6.2.4 Statistical Analyses*

Baseline differences between the intervention group and the control group were tested with *t* tests for continuous variables, Pearson's Chi-square tests for dichotomous variables such as gender and health care utilization (yes/no), and Mann-Whitney tests for disease.

Between-group analyses of covariance (ANCOVA) were performed to compare the intervention group with the control group with regard to the number of visits to the different health services. Treatment group (intervention/control) was used as the independent variable. Baseline score and gender were used as covariates, and block (of about twenty-five people, each with various diseases) was used as a factor. Correlations of the baseline scores and both post-intervention measurement scores on the outcome variables ranged from .31 to .67. Because the severity of the disease might have influenced the results, baseline physical functioning (measured with the RAND-36, see [31]) and type of disease were used as control variables. Since only a few people had a heart disease ( $n=8$ ), and a heart disease in this older population is often caused by diabetes, heart disease was combined with diabetes. Thus, type of disease was represented by two dummy variables, one for arthritis and one for lung disease. Preliminary checks were made to ensure that there was no violation of the assumptions of normality, linearity, homogeneity of variances, homogeneity of regression slopes, or reliable measurement of the covariates. In view of the directionality of the research hypotheses, i.e., expecting less health care utilization in the intervention group compared to the control group, one-tailed tests were carried out. The level of significance was  $\alpha=0.05$ , and all analyses were performed in SPSS 12.0.2 [32].

### **6.3 Results**

#### *6.3.1 Subjects*

Of the original sample of 144 patients, 129 (89.6%) completed the second post-intervention measurement. Of these, 67 (52%) were in the intervention group. No differences were found at baseline with regard to any of the patient characteristics, confirming the random allocation to treatment. The characteristics of the 15 patients who were lost to follow-up at six-months were similar to those of the patients who remained in the study with respect to demographic variables.

### 6.3.2 Health care utilization

Table 6.1 shows the number (percentages) of people who made use of the different health care services, at baseline and at 6 months. No significant differences were found between the intervention group and the control group, either at baseline or at 6 months. Because some health care services had been visited or used by only ten people or less at all measurement points, we excluded these services from further analyses. This concerned the social worker, the unpaid volunteer, the emergency department, and admission to a nursing home, rehabilitation center, psychiatric hospital, or other institution.

Table 6.2 presents the mean number of visits (SD, range) to the different health services in the intervention group and the control group at baseline and at 6 months. After adjusting for the covariates and the factor mentioned earlier, no significant differences were found between the intervention group and the control group with regard to number of visits to a GP [ $t(113)=.424, p=.336$ , partial  $\eta^2=.002$ ], number of visits to a medical specialist [ $t(115)=-.759, p=.225$ , partial  $\eta^2=.005$ ], total visits to a physician [ $t(113)=.247, p=.403$ , partial  $\eta^2=.001$ ], number of visits to a physical therapist [ $t(116)=.424, p=.336$ , partial  $\eta^2=.002$ ], and number of days hospitalized [ $t(117)=.559, p=.289$ , partial  $\eta^2=.003$ ]. With regard to home care utilization, a weak but significant difference was found between the intervention group and the control group [ $t(115)=1.716, p=.045$ , partial  $\eta^2=.025$ ]. The data showed that for the majority in both the intervention group (74%) and the control group (71%) there was no change in home care utilization, but that the significant difference was due to the combination of a decrease in utilization in the intervention group and an increase in the control group. The decrease in the intervention group was due to two people, who, at baseline, needed home care temporarily, one after rehabilitation and the other because of a broken shoulder. The increase in health care utilization in the control group was due to three patients who had a hip-operation, and therefore needed home care at T2. This difference between the intervention group and the control group with regard to home care utilization was therefore due to acute medical incidents, and not to ways of coping with a chronic disease.





Table 6.1 Percentages of people in the intervention and the control group using the different health services at baseline and at 6 months ( $p$ -values for  $\chi^2$ -tests)

Variable	Baseline			Six months		
	Intervention 67	Control 62		Intervention 67	Control 62	
<i>N</i>	N (%)	N (%)	<i>P</i> -value	N (%)	N (%)	<i>P</i> -value
General practitioner	53 (79.1)	54 (87.1)	.228	60 (89.6)	54 (87.1)	.664
Medical specialist	59 (88.1)	52 (83.9)	.493	59 (88.1)	53 (85.5)	.666
Total visits to a physician	64 (95.5)	61 (98.4)	.348	66 (98.5)	58 (93.5)	.145
Physical therapist	20 (29.9)	21 (33.9)	.624	23 (34.3)	17 (27.4)	.397
Social worker	6 (9.0)	4 (6.5)	.595	4 (6.0)	3 (4.8)	.777
Home care	20 (29.9)	20 (32.3)	.768	15 (22.4)	16 (26.2)	.612
Unpaid volunteer	3 (4.5)	3 (4.8)	.922	3 (4.5)	4 (6.5)	.621
Visits to emergency department	5 (7.5)	5 (8.1)	.898	7 (10.4)	5 (8.1)	.642
Hospital	12 (17.9)	7 (11.3)	.289	9 (13.4)	12 (19.4)	.363
Nursing home	-	1 (1.6)	.297	1 (1.5)	-	.334
Rehabilitation center	1 (1.5)	-	.334	-	2 (3.2)	.138
Psychiatric hospital	-	-	-	-	-	-
Other institution	-	-	-	-	-	-



Table 6.2 Mean number of visits (SD, range) in the intervention and the control group at baseline and at 6 months (*p*-values of t-tests)

	Baseline					Six months				
	Intervention 67		Control 62		<i>P</i>	Intervention 67		Control 62		<i>P</i> -value
<i>N</i>	M (SD)	range	M (SD)	range		M (SD)	range	M (SD)	range	
<b>Variable</b>	M (SD)	range	M (SD)	range	<i>P</i>	M (SD)	range	M (SD)	range	<i>P</i> -value
General practitioner	3.0 (2.9)	0-15	4.2 (4.9)	0-24	.082	3.1 (2.3)	0-12	4.1 (5.1)	0-26	.133
Medical specialist	2.8 (2.2)	0-10	2.2 (2.7)	0-19	.125	2.7 (2.8)	0-15	2.2 (1.7)	0-7	.200
Total visits to a physician	5.8 (3.9)	0-17	6.4 (5.7)	0-26	.482	5.8 (4.3)	0-24	6.3 (5.9)	0-29	.575
Physical therapist	6.3 (13.0)	0-52	7.4 (14.5)	0-52	.659	5.6 (11.6)	0-52	5.3 (11.8)	0-52	.861
Home care	11.3 (29.3)	0-182	11.6 (30.0)	0-182	.966	8.7 (24.7)	0-160	15.5 (41.9)	0-194	.261
Hospital admission	0.2 (0.6)	0-2	0.1 (0.3)	0-1	.081	0.2 (0.3)	0-1	0.3 (0.6)	0-3	.381
Duration of hospitalization (days)	1.3 (4.6)	0-33	0.4 (1.4)	0-7	.104	1.1 (4.4)	0-25	1.2 (2.8)	0-13	.828



In order to check whether the results might have been influenced by outliers, we decided to categorize the health care utilization. We used the categories described by Westert et al. [2], which are ordinal i.e., the first category relates to the lowest level of health care utilization, and the last category to the highest level, as follows :

1. No services used
2. Primary Care (GP and home care and/or physiotherapist; minimum of two types)
3. Medical Care (GP or medical specialist)
4. Clinical Care (GP and/or medical specialist and/or hospitalization; minimum of two types)
5. Comprehensive Care (GP and/or home care and/or physiotherapist and/or medical specialist and/or hospitalization; minimum of three types).

Table 6.3 shows the percentage of people with a higher, lower and similar level of health care utilization at six months, compared to baseline. No significant differences were found between the intervention group and the control group. This result does not confirm our expectations that health care utilization in the intervention group would decrease.

Table 6.3 Percentage of people (N) with a higher, lower and similar level of health care utilization at 6 months, compared to baseline

	<b>Intervention</b>	<b>Control</b>
Lower (difference <0)	15% (10)	2% (16)
Similar (difference =0)	61% (41)	59% (36)
Higher (difference >1)	24% (16)	15% (9)

## 6.4 Discussion

In this study we evaluated the effects of the CDSMP on health care utilization among chronically ill older people in the Netherlands. Based on studies carried out in other countries, we expected to find a decrease in health care utilization in the longer term. A significant difference was found between the intervention group and the control group with regard to home care utilization, but qualitative inspection of the data showed that this effect could not be attributed to the intervention. No effects were found with regard to visits to a GP, visits to a medical specialist, total visits to a physician, visits to a physical therapist, or number of days hospitalized.



One possible explanation for finding almost no effects, in contrast to the findings in the USA, is that the USA has a different health care system and a different health insurance policy. For example, in the Netherlands, the GP acts as gatekeeper to the health care system, and patients must be referred by a GP to all other health care services. It is therefore possible that the number of visits to a GP is relatively high in our study population.

In order to know whether the lack of effects with regard to the number of visits to the different health care services might have been caused by our specific study sample, health care utilization in our sample was compared to that in a sample of chronically ill patients aged 45 years and older in the Netherlands [3], and to the samples in previous studies of the CDSMP [18;20-22;33]. Compared to other chronically ill people in the Netherlands, the patients in our study did not differ very much with regard to visits to most of the health care services, but they visited a physical therapist less often, and were less often admitted to a hospital. Compared to the (mainly American) samples in other studies of the CDSMP, our sample was similar in health care utilization. Therefore, the lack of effects was probably not due to floor or ceiling effects.

Our study has some limitations. First, the follow-up period in our study was six months. However, a great majority of the studies investigating the effect of self-management programs on health care utilization had follow-up periods of one to three years. It could be that the period of six months in our study was too short to bring about a reduction in health care utilization, but unfortunately, measuring the effects of the CDSMP after 12 months was beyond the scope of this study. Therefore, an important recommendation for future research on the effects of the CDSMP on health care utilization is to include a follow-up period of at least one year.

Secondly, our results might be influenced by the way in which some aspects of health care utilization were measured. Certain health care services might have overlapped each other, for instance receiving physical therapy during admission in a nursing home. It might therefore be questioned whether our measurement methods were sensitive enough to measure these separate aspects of health care utilization.

Thirdly, we collected data through self-report, over a period of six months, and this can be quite a long period in which to recall all health care utilization, especially in an older population. In a study carried out by Ritter et al. [34], also with an older study population, a tendency towards under-reporting of visits to a physician was found, and also a tendency towards over-reporting of visits to an emergency department. This problem might be overcome, for example, by using





a monthly questionnaire, by asking participants to keep a diary of their health care utilization, or by checking the medical records.

To summarize, in this study we found no convincing evidence for a decrease in health care utilization as a result of the CDSMP. More research is needed to investigate more thoroughly the long-term effectiveness of the CDSMP in decreasing health care utilization in the Netherlands.



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