Coordinated Individual Education with an Arthritis Passport for Patients with Rheumatoid Arthritis

Robert P. Riemsma, Erik Taal, Herman L. M. Brus, Johannes J. Rasker, and Oene Wiegman

Objective. To evaluate the effects of a program for individual education in combination with the use of an arthritis passport.

Methods. We studied 3 groups of patients with rheumatoid arthritis. The first experimental group received educational materials and followed the program under the guidance of their regular providers of health care whose activities were coordinated through arthritis passports. The second experimental group only received education materials; the control group received only usual care.

Results. There were no effects on self-efficacy expectations, knowledge, health status, or behavior in either experimental group. Opinions of general practitioners, physiotherapists, and visiting nurses concerning the arthritis passport were very positive, but rheumatologists' opinions were not. Opinions on coordination of care were more positive among the physiotherapists of the experimental group.

Conclusions. Individual education for patients with rheumatoid arthritis by health care providers during routine consultations, as implemented in this program, had no effect on self-efficacy expectations, knowledge, health status, or health behavior. Likewise, the distribution of educational materials by itself without the involvement of health care providers had no effect. The use of the arthritis passport improved coordination of care, especially for physiotherapists.

Key words. Rheumatoid arthritis; Patient education; Coordination; Arthritis passport.

INTRODUCTION

For patients with rheumatoid arthritis (RA), adequate self-management is extremely important (1,2). RA is a chronic, disabling disease with an unpredictable course including periods of exacerbation and remission of disease activity (3,4). Because RA cannot be cured, the goals of treatment and management are the relief of pain, the prevention of joint destruction, and the preservation or improvement of patient functioning. Treatment usually consists of a combination of patient education, rest, physical and occupational therapy, and medication (5), all of which must be continuously adapted to changes in disease activity. Such a regimen requires adequate treatment and support from health care providers. The patients themselves also have an important role in the management of the disease. They must learn to adjust rest, exercise, and medication to variation in disease activity, sometimes daily. Patient education can help patients make informed decisions regarding their treatment and acquire the self-management skills necessary to deal with the consequences of their disease (6,7).
Patient education should not only lead to changes in knowledge, but also to changes in behavior and health status (8). It is important to assess the needs of patients and to tailor patient education to these needs. This points to the importance of a thorough analysis of the health problems patients experience and of the determinants of these problems before designing an educational intervention (9). It means that the education should be well planned and carefully conceived and delivered (9,10). The effectiveness of patient education is determined by the quality of the planning process (10).

On the basis of these criteria and of experiences with the Arthritis Self-Management Course (11) in the United States, social learning theory (12), and a pilot study on RA patients and health care providers (1), we have developed a program of group education (2,8). According to social learning theory, the most important mechanism in changing behavior is self-efficacy expectation (12,13). The latter refers to one's beliefs in one's capability to execute successfully the behavior required to produce a certain desired outcome. Self-efficacy is an important determinant of self-management behavior (14,15). Self-management involves a continuous process of making behavioral choices and decisions. Self-efficacy expectations strongly influence these choices and decisions and determine the amount and persistence of effort made in performing self-management activities (12). Strengthening self-efficacy expectations is very important in interventions to enhance self-management behavior (15).

We found significant positive short-term effects of an earlier group education program on functional disability, joint tenderness, practice of relaxation exercises and physical exercises, self-management behavior, outcome expectations, self-efficacy expectations with regard to physical functioning, and knowledge. The positive effects on practice of physical exercises, self-efficacy expectations with regard to physical functioning, and knowledge were still found 14 months later (2).

In the present study, we investigate whether these results can be matched or improved with an individual education program based on the same principles.

A variety of health care providers are involved in the treatment of RA patients. As a result, patients and their families are sometimes confronted with conflicting, often confusing, advice. Coordinating and integrating the many health care services and professionals involved is a challenging task (16). Lack of coordination is becoming a serious threat to health care. We, therefore, discussed the contents of our program with the main health care providers involved with the participants, i.e., rheumatologists, general practitioners, physiotherapists, and visiting nurses.

One method of improving coordination is to improve communication (17). This can be achieved through the use of an “arthritis passport,” which does not require a large investment in personnel or computers (18,19). The intention is that the various health care providers register all their activities and conclusions with regard to the patient to whom the passport has been issued—including medications, therapies, laboratory results, and operations. Patients have their passports in their own keeping, and it is their responsibility to see that each consulted professional records the appropriate information.

In this study, we assess the effect of our individual education program, in combination with the use of an arthritis passport, on knowledge, self-efficacy expectations, health behavior, and health status. We also evaluate the effects of improved coordination of educational activities and communication among health care providers.

**PATIENTS AND METHODS**

**Intervention.** During a 6-month period, selected patients received information from their rheumatologists, general practitioners, physiotherapists, and visiting nurses. These health care providers had received oral instructions as well as a protocol in which the aims and methods of the project were explained. They were asked to discuss certain chapters from an accompanying self-help guide with the patients selected for the intervention during their regular consultations. The guide included the following chapters: Contracting, Goal-Setting and Feedback, Self-Management and Problem-Solving, Information on RA and Treatment, Pain Management and Relaxation, Physical Exercises, Communication Skills, and Coping with Depression. The content was based on our earlier group education program (2). In that program, group members helped each other in solving problems. This so-called modeling is one of the most effective means of influencing self-efficacy expectations and self-management behavior (12,14,15). For our individual education program we developed a videotape in which patients acted as models, demonstrating relaxation exercises, physical exercises, the importance of goal-setting and the use of contracts, self-management and problem-solving skills, and other topics from the guide. The videotape was also intended to stimulate patients to use the guide.

Each patient selected for the intervention was given a copy of the self-help guide, the above-mentioned videotape, an audiotape to accompany relaxation exercis-
es, a brochure on practical aids for RA patients, and an arthritis passport. The health care providers were asked to document their activities in the passport at each consultation. The patients held these in trust for the 6 months of the experimental period and were instructed to ask the health care providers to document their activities at each consultation.

Our arthritis passport is divided into 7 parts. The first is for general information about the patient: name, address, telephone number, work situation, and names and telephone numbers of the patient's rheumatologist and general practitioner. This page is to be filled out by the researcher, together with the patient, at the beginning of the study. The rheumatologists are asked to describe any concomitant diseases on this page. In the second part, the various health care providers are to record the following at the time of their first consultation: their disciplines, the dates, their names, towns of residence, and telephone numbers. In the third part, they are to document the treatment and the topics discussed during each consultation. The fourth part is for recording any medications prescribed. The fifth can be used by patients as well as by professionals to report any aids or adjustments to the home environment. The sixth part is for information on any operations, which is to be supplied by the surgeons concerned. In the seventh part, patients and professionals can comment on treatments. The passport also includes an address and a telephone number at which the researcher can be reached for answers to any questions that may arise in connection with the project.

Design. The educational program was evaluated according to a field-experimental design with 2 experimental groups and 1 control group. Assessments of all 3 groups were performed at baseline, i.e., the month prior to the start of the intervention, again after 7 months, i.e., 1 month after the intervention, and finally after 19 months. Patients in the first experimental group (E1) received individual, coordinated education as described above. Patients in the second experimental group (E2) received the same educational materials as the E1 patients, but were not provided with arthritis passports, and the health care providers concerned were not informed about the project and were provided no instruction. Patients in the control group received traditional care. At the start of the intervention all patients were referred to a physiotherapist for individual instruction and guidance with regard to the performance of physical exercises.

Respondents. During the 6-month study period all RA patients who visited the outpatient clinics of the 5 rheumatologists of the Medisch Spectrum Twente, Enschede, and the Twenteborg Ziekenhuis, Almelo, both in the Netherlands, were asked to complete a 1-page questionnaire concerning the frequency of their consultations with rheumatologists, general practitioners, physiotherapists, and visiting nurses. All those between the ages of 20 and 70 who, according to their answers, had consulted providers of health care from 2 or more disciplines during the previous 6 months and whose RA diagnoses met the revised American College of Rheumatology (formerly the American Rheumatism Association) criteria (20), were asked to participate in the study (n = 325). Two hundred forty-nine agreed, and 216 actually participated.

The patients were allocated to 3 groups. It was essential for comparisons between health care providers that they have only patients in 1 of 3 conditions. This necessitated a very complex randomization strategy. First, a patient was chosen at random from among the patients who had agreed to participate and was assigned to the first group. The assignment was then closed with respect to the relationship of sharing a nonspecialist health care provider. All other patients who had the same general practitioner, physiotherapist, or visiting nurse as the one selected were assigned to the same group. Next, all patients who were as yet unallocated and shared a nonspecialist with any of those already assigned to the first group were assigned to the same group. This last step was repeated until there was no one left in the pool of unallocated patients who shared a health care provider other than a rheumatologist with anyone already allocated. Another patient was then selected at random from the remaining pool and assigned to the second group. This assignment was likewise closed with respect to the relationship of sharing a nonspecialist health care provider. A new patient was selected at random from the then remaining pool of unallocated patients and assigned to the third group. The assignment was then closed as before. The remaining pool of unallocated patients was subsequently exhausted in stages by selecting an unallocated patient at random, assigning that patient to whichever of the 3 groups was smallest at that stage, and closing the assignment. Thus, patients in different groups had different general practitioners, physiotherapists, and visiting nurses, the purpose being to prevent bias. Finally, the 3 groups were designated at random to be E1, E2, or the control group.

Together, the patients who eventually participated consulted a total of 5 rheumatologists, 145 general practitioners, 124 physiotherapists, and 29 visiting nurses. Being so few, the rheumatologists necessarily had patients from different groups in their care. This, however, prevented bias of another sort, because the conditions on which the allocation of the patients were
based were possibly not independent of the rheumatologists that they consulted. Each rheumatologist had approximately 15 patients from E1 in care, while general practitioners, physiotherapists, and visiting nurses had at most 3 each.

**Assessments.** The patients were asked to come to the hospital for clinical and laboratory assessments at baseline, after 7 months, and after 19 months. At each of these visits, they returned questionnaires that had been sent to them 2 weeks in advance and that they had completed at home. During the first visit the patients were informed further about the project.

The questionnaire for patients dealt with health status, health behavior, self-efficacy expectations, knowledge, frequency of use of health services, number and type of topics discussed with providers of health care, use of and satisfaction with the arthritis passport, and certain patient characteristics.

Health status was measured on the questionnaire with the Dutch Arthritis Impact Measurement Scales (AIMS) (21) and a Dutch version of the Modified Health Assessment Questionnaire (M-HAQ) (22). The subscales of the Dutch-AIMS used were: Mobility, Physical Activity, Dexterity, Household Activities, Activities of Daily Living (ADL), Pain, Social Activity, Depression, and Anxiety. The internal consistencies of the Dutch-AIMS scales, as measured by Cronbach’s alpha, range from 0.68 for Physical Activities and ADL to 0.92 for Anxiety. That of the M-HAQ is 0.91. We also included the Dutch-AIMS Visual Analog Scale for Arthritis Impact. One item left space for listing comorbidities. In another, patients were to indicate duration of RA.

Health behavior was assessed by asking patients how many times a week and how many minutes per session they performed relaxation exercises, physiotherapeutic exercises, or other physical activities, such as swimming, walking, or bicycling. In this study the third category is described as endurance exercises. The results are expressed in minutes per week.

Self-efficacy expectations were measured with a Dutch version of Lorig and colleagues’ Arthritis Self-Efficacy Scales (2,23). The scales are Self-Efficacy Pain, 5 statements dealing with pain coping (Cronbach’s $\alpha = 0.79$); Self-Efficacy Function, 8 statements dealing with physical functioning (Cronbach’s $\alpha = 0.91$); and Self-Efficacy Other Symptoms, 6 statements dealing with coping with other symptoms such as depression, fatigue, and frustration (Cronbach’s $\alpha = 0.84$). Items are completed by indicating to what extent one agrees with the statements given on a 5-point scale, where 1 = thoroughly disagree and 5 = thoroughly agree.

Knowledge about RA and its treatment and management was assessed by 10 items. Each item included a statement, such as “Women suffer more often from rheumatoid arthritis than men,” and “People with rheumatoid arthritis should not do physical exercises, because it may damage their joints,” which respondents could designate as right or wrong. A third option was “don’t know.” The correct responses were easy to find in the self-help guide. The score for this scale is the number of correct answers, “don’t know” counting as an incorrect answer. The scale’s internal consistency is 0.58.

Use of health services was measured by number of consultations during the previous 6 months. The patients themselves indicated how often they had consulted any health care provider during the period in question.

To determine the number of topics discussed, we presented a list of 18 topics and asked the patients which had been discussed and by whom. These topics were: cause, treatment, and course of RA; joint protection; psychosocial problems; work adjustments; household adjustments; nutrition; exercises and physiotherapy; endurance exercises; relaxation; aids and devices: medicines; side effects of medicines; alternative treatments; surgery; ADL activities; doctor–patient communication; the use of “contracts with yourself”; and sexuality. Patients could also add other items. For each patient we counted the number of topics discussed by each and took the sum of the 4 totals as the score.

Use of the arthritis passport was assessed by asking how often patients gave their passports to any of the health care providers and how often anything was recorded by any of them. There were 5 response options: always (=5), most of the time, sometimes, seldom, and never (=1). General appraisals of the arthritis passport could be given on 4 bipolar 5-points scales, which ranged from very bad (=1) to very good (=5), from very confusing (=1) to easily understandable (=5), from very incomplete (=1) to very complete (=5), and from very useless (=1) to very useful (=5). The extent to which the patients agreed or disagreed with the statements “I think the health care providers are better informed about each others’ activities because of the arthritis passport” and “I think everybody with arthritis should have an arthritis passport” could be indicated on two 5-point scales, where 1 = thoroughly disagree and 5 = thoroughly agree.

The patient characteristics requested in the questionnaire are: age, sex, marital status, and level of education.

The clinical assessments were performed by a rheumatologist (HLMB). Ten-meter walking time, grip strength (24), Ritchie index (25), number of swollen joints, and functional class (26) of each participant
were determined, and the button test was administered. The number of swollen joints was assessed by examining 46 joints.

The laboratory tests included erythrocyte sedimentation rate (Westergren method), hemoglobin concentration, and thrombocyte count.

The questionnaire for health care providers included questions concerning satisfaction with the arthritis passport and coordination of care and educational activities.

General appraisals of the arthritis passport could be given on 4 bipolar 5-point scales: general, ranging from very bad to very good; usefulness, ranging from very useless to very useful; coordination, ranging from worsening coordination among health care providers to improving coordination among health care providers; and knowledge, ranging from reducing knowledge about other health care providers to improving knowledge about other health care providers. The extent to which they agreed or disagreed with the statements "Thanks to the arthritis passport, I'm now better informed about the activities of other health care providers", "The use of the arthritis passport will lead to the timely identification of problems with RA patients", and "The use of the arthritis passport improves the coordination of care between health care providers dealing with RA patients" could be indicated on 3 5-point scales. The scales ranged from thoroughly disagree (=1) to thoroughly agree (=5).

The appraisal of the coordination of care was measured analogously on 5 5-point scales ranging from very much disagree (=1) to very much agree (=5). The statements in this case were: "At present, health education activities provided by the various health care providers dealing with the RA patients are adequately coordinated", "I'm well-informed about the consultations of the RA patients with other health care providers", "At present, there is sufficient continuity in the health education activities for the RA patients concerned", "I frequently communicate with other health care providers involved with the RA patients concerned", "When problems concerning the coordination of care arise between those providing health care for the RA patients concerned, they will be quickly identified."

Statistics. Differences between groups at baseline were evaluated by 1-way analyses of variance of all variables. The Student-Newman-Keuls test was used to make pairwise comparisons between groups. Dependent variables for which there were significant differences between groups at baseline were included as covariates in the analyses over time. Repeated measures analyses of variance were applied to the changes in the mean scores of the outcome variables between groups over time. The relevant tables give the mean scores of the groups at all 3 assessments, together with the within-subject effect (time) and interaction effects of time and group and their significance. P values less than 0.05 were considered significant. A Bonferroni correction was used because the number of analyses was large. Chi-square tests were used to compare categorical variables.

Differences between the opinions of provider participants concerning the coordination of care for the different groups were tested with 1-way analyses of variance.

Ethics. The study was approved by the Ethics Committee of the Medisch Spectrum Twente in Enschede.

RESULTS

Twenty-four of the 249 patients who had initially agreed to participate decided to withdraw from the study before the baseline assessment. Nine other patients dropped out in the course of the study: 7 could not be reached for one or both of the followup assessments, one died, and one could not longer participate owing to mental problems.

The distribution of the demographic characteristics of the participants is given in Table 1. Their mean age was 58 years. Two-thirds were women. Mean duration of RA was 13 years. One hundred nineteen participants (55%) reported no comorbidities, 71 (33%) reported 1 comorbidity, 20 (9%) reported 2 comorbidities, and 6 (3%) reported more than 2.

The 5 participating rheumatologists each had patients from all 3 groups in their care. The patients of E1 (n = 69) were in the care of 44 general practitioners, 49 physiotherapists, and 14 visiting nurses. During the 6-month intervention period, some providers of health care had seen more than one of these patients, while some patients had not consulted a general practitioner, physiotherapist, or visiting nurse. The patients of E2 (n = 75) were in the care of 48 general practitioners, 39 physiotherapists, and 6 visiting nurses. The patients in the control group (n = 72) were cared for by 53 general practitioners, 36 physiotherapists, and 9 visiting nurses.

The mean numbers of visits and mean numbers of items discussed are presented in Table 2. There were no significant differences between the groups at baseline. All patients consulted their rheumatologists more often than they consulted any of the other health care providers. While the educational program was in progress, visits to the physiotherapist were as frequent as those to the rheumatologist, owing to the referrals
Table 1. Demographic characteristics, comorbidities, and duration of rheumatoid arthritis (RA) among 216 patients in experimental group with coordination (E1), experimental group without coordination (E2), and control group (C)

<table>
<thead>
<tr>
<th>Demographic characteristics</th>
<th>E1 n = 69</th>
<th>E2 n = 75</th>
<th>C n = 72</th>
<th>All n = 216</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>67%</td>
<td>66%</td>
<td>65%</td>
<td>66%</td>
<td>NS*</td>
</tr>
<tr>
<td>Married</td>
<td>81%</td>
<td>80%</td>
<td>82%</td>
<td>81%</td>
<td>NS</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary school</td>
<td>32%</td>
<td>35%</td>
<td>33%</td>
<td>34%</td>
<td>NS</td>
</tr>
<tr>
<td>Junior vocational school†</td>
<td>33%</td>
<td>27%</td>
<td>28%</td>
<td>29%</td>
<td></td>
</tr>
<tr>
<td>Senior vocational school</td>
<td>35%</td>
<td>38%</td>
<td>39%</td>
<td>37%</td>
<td></td>
</tr>
<tr>
<td>Age, years (SD)</td>
<td>56.70 (10.39)</td>
<td>59.09 (9.63)</td>
<td>57.72 (9.22)</td>
<td>57.87 (9.75)</td>
<td>NS</td>
</tr>
<tr>
<td>Duration of RA, years (SD)</td>
<td>14.24 (10.72)</td>
<td>12.89 (9.82)</td>
<td>12.99 (10.94)</td>
<td>13.35 (10.46)</td>
<td>NS</td>
</tr>
<tr>
<td>Comorbidities, no. (SD)</td>
<td>0.59 (0.97)</td>
<td>0.64 (0.97)</td>
<td>0.60 (0.66)</td>
<td>0.61 (0.83)</td>
<td>NS</td>
</tr>
</tbody>
</table>

* NS = not significant.
† Junior vocational training continues to age 16, senior vocational training to age 18.

called for by the intervention. However, most patients visited the physiotherapist only 2 or 3 times to discuss individual home training programs.

The mean numbers of visits per discipline per group varied to a greater or lesser extent from one assessment to the next. The mean number of visits to the rheumatologist was more or less constant in E2 throughout the study, but decreased in both other groups. The mean number of visits to the general practitioner increased in the control group, but decreased in E1 and E2. These were the only significant differences between groups in this respect.

The mean number of topics discussed likewise varied from one assessment to the next, but changed significantly with regard to only one discipline. The mean number discussed with the physiotherapists showed an overall increase during the intervention. This is directly related to the number of visits.

The effects of the intervention on health status, laboratory tests, behavior, self-efficacy, and knowledge are presented in Table 3.

At baseline there were significant differences between groups with respect to 3 variables. The mean score on the household activities scale was significantly lower in E2 than in E1 (F = 3.09, P = 0.05). The mean score on the depression scale was significantly higher in the control group than in either of the experimental groups (F = 3.79, P = 0.02). The mean score for self-efficacy with respect to other symptoms was significantly lower in the control group than in E2 (F = 3.32, P = 0.04). To control for these baseline differences, we used the baseline values of these variables as covariates in the repeated measurements analysis of variance.

There were no significant interaction effects. There were some changes over time, but they occurred in all

Table 2. Number of visits to health care providers and number of topics discussed before, immediately after, and one year after intervention in experimental group with coordination (E1, n = 69), experimental group without coordination (E2, n = 75), and control group (C, n = 72)

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>7 months</th>
<th>19 months</th>
<th>Time effect (F)</th>
<th>Interaction effect (F)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>E1</td>
<td>E2</td>
<td>C</td>
<td>E1</td>
<td>E2</td>
</tr>
<tr>
<td>Number of visits</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rheumatologist</td>
<td>3.4</td>
<td>3.3</td>
<td>3.6</td>
<td>3.2</td>
<td>3.0</td>
</tr>
<tr>
<td>General practitioner</td>
<td>2.8</td>
<td>2.5</td>
<td>2.1</td>
<td>2.6</td>
<td>2.3</td>
</tr>
<tr>
<td>Physiotherapist</td>
<td>2.3</td>
<td>2.5</td>
<td>2.2</td>
<td>3.9</td>
<td>2.7</td>
</tr>
<tr>
<td>Visiting nurse</td>
<td>1.6</td>
<td>1.4</td>
<td>1.3</td>
<td>1.6</td>
<td>1.5</td>
</tr>
<tr>
<td>Number of items discussed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rheumatologist</td>
<td>3.2</td>
<td>3.1</td>
<td>3.6</td>
<td>3.0</td>
<td>2.7</td>
</tr>
<tr>
<td>General practitioner</td>
<td>1.7</td>
<td>1.2</td>
<td>1.4</td>
<td>1.2</td>
<td>1.3</td>
</tr>
<tr>
<td>Physiotherapist</td>
<td>1.1</td>
<td>1.4</td>
<td>1.2</td>
<td>2.8</td>
<td>2.0</td>
</tr>
<tr>
<td>Visiting nurse</td>
<td>0.7</td>
<td>0.5</td>
<td>0.9</td>
<td>0.7</td>
<td>0.4</td>
</tr>
</tbody>
</table>

* P < 0.001.
† P = 0.05, after Bonferroni correction.
<table>
<thead>
<tr>
<th>Table 3. Effects of individual education on health status, laboratory tests, behavior, self-efficacy, and knowledge in experimental group with coordination (E1, n = 69), experimental group without coordination (E2, n = 75), and control group (C, n = 72)*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Behavior</strong></td>
</tr>
<tr>
<td>E1</td>
</tr>
<tr>
<td><strong>Hemoglobin</strong></td>
</tr>
<tr>
<td><strong>Thrombocytes</strong></td>
</tr>
<tr>
<td><strong>Advisor</strong></td>
</tr>
<tr>
<td><strong>Physical exercises</strong></td>
</tr>
<tr>
<td><strong>Endurance exercises</strong></td>
</tr>
<tr>
<td><strong>SE-pain</strong></td>
</tr>
<tr>
<td><strong>SE-function</strong></td>
</tr>
<tr>
<td><strong>SE-other symptoms</strong></td>
</tr>
<tr>
<td><strong>Arthritis knowledge</strong></td>
</tr>
</tbody>
</table>

*ADL = activities of daily living; M-HAQ = Modified Health Assessment Questionnaire; ESR = erythrocyte sedimentation rate.

†P ≤ 0.05, after Bonferroni correction.

‡P ≤ 0.01.

3 groups and cannot, therefore, be due to the intervention. Much to our amazement, even arthritis knowledge decreased in all 3 groups.

Ninety percent of the patients of E1 indicated on their questionnaires that they always gave their arthritis passports to their rheumatologists at consultations or did so most of the time. Seventy-two percent gave 1 of these 2 responses with regard to general practitioners, 80% with regard to physiotherapists, 50% with regard to visiting nurses, and 63% with regard to other providers of health care. All the rheumatologists and visiting nurses, 97% of the general practitioners, 92% of physiotherapists, and 82% of other health care providers indicated that when given a passport they wrote something in it “always” or “most of the time.”

In their general appraisal of the arthritis passport 77% of E1 patients thought it fairly good or very good, 75% thought it fairly or very understandable, 67% thought it fairly or very complete, and 69% thought it fairly or very useful. The statements “I think the health care providers are better informed about each other’s activities thanks to the arthritis passport” and “I think everybody with arthritis should have an arthritis passport” were agreed with by 75% and 76% of these patients, respectively.

The response rates of the health care providers involved in the intervention in giving their opinions of the passport were 100% for rheumatologists, 59% for general practitioners, 80% for physiotherapists, and 79% for visiting nurses. The results are sum-
Table 4. Opinions of rheumatologists (n = 5), general practitioners (n = 26), physiotherapists (n = 39), and visiting nurses (n = 11) of patients in the experimental group with coordination about the arthritis passport, using a 5-point scale in which 1 stands for a negative view and 5 for a positive view

<table>
<thead>
<tr>
<th></th>
<th>Rheumatologist</th>
<th>General practitioner</th>
<th>Physiotherapist</th>
<th>Visiting nurse</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>2.60</td>
<td>3.47</td>
<td>3.56</td>
<td>3.73</td>
</tr>
<tr>
<td>Usefulness</td>
<td>2.20</td>
<td>3.37</td>
<td>3.44</td>
<td>3.73</td>
</tr>
<tr>
<td>Coordination</td>
<td>3.40</td>
<td>3.63</td>
<td>3.66</td>
<td>3.45</td>
</tr>
<tr>
<td>Knowledge</td>
<td>3.40</td>
<td>3.47</td>
<td>3.66</td>
<td>3.73</td>
</tr>
<tr>
<td>Statement 1*</td>
<td>2.20</td>
<td>3.28</td>
<td>3.61</td>
<td>4.00</td>
</tr>
<tr>
<td>Statement 2</td>
<td>2.20</td>
<td>3.12</td>
<td>3.53</td>
<td>3.73</td>
</tr>
<tr>
<td>Statement 3</td>
<td>2.60</td>
<td>3.32</td>
<td>3.53</td>
<td>3.54</td>
</tr>
</tbody>
</table>

* Statements: 1. "Thanks to the arthritis passport, I'm now better informed about the activities of other health care providers"; 2. "The use of the arthritis passport will lead to the timely identification of problems with rheumatoid arthritis (RA) patients"; 3. "The use of the arthritis passport improves the coordination of care between health care providers dealing with RA patients."

Table 5. Mean scores of health care providers of experimental group with coordination (E1, n = 69), experimental group without coordination (E2, n = 75), and control group (C, n = 72) on statements concerning the coordination of care, using a 5-point scale in which 1 stands for a negative view and 5 for a positive view

Table: Coordinated Individual Education

<table>
<thead>
<tr>
<th></th>
<th>Rheumatologist</th>
<th>General practitioner</th>
<th>Physiotherapist</th>
<th>Visiting nurse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statement 1 (coordination)*</td>
<td>3.60</td>
<td>3.64</td>
<td>3.32</td>
<td>3.24</td>
</tr>
<tr>
<td>Statement 2 (other consultations)</td>
<td>2.60</td>
<td>3.60</td>
<td>3.26</td>
<td>3.00</td>
</tr>
<tr>
<td>Statement 3 (continuity)</td>
<td>3.60</td>
<td>3.64</td>
<td>3.43</td>
<td>3.33</td>
</tr>
<tr>
<td>Statement 4 (frequency contacts)</td>
<td>3.20</td>
<td>2.60</td>
<td>2.36</td>
<td>2.37</td>
</tr>
<tr>
<td>Statement 5 (problems)</td>
<td>3.20</td>
<td>3.12</td>
<td>3.26</td>
<td>3.03</td>
</tr>
</tbody>
</table>

* The 5 rheumatologists had patients in all 3 groups.
† Statements: 1. "At present, there is sufficient continuity in the health education activities provided by the various health care providers dealing with the rheumatoid arthritis (RA) patients who are adequately coordinated"; 2. "At present, there is sufficient coordination in the arthritis passport activities for the RA patients concerned"; 3. "At present, there is sufficient coordination in the arthritis passport activities for the RA patients concerned"; 4. "At present, there is sufficient coordination in the arthritis passport activities for the RA patients concerned"; 5. "At present, there is sufficient coordination in the arthritis passport activities for the RA patients concerned"; 6. "At present, there is sufficient coordination in the arthritis passport activities for the RA patients concerned."
this study demonstrate that providers should not continue to provide patient education. But health care providers are apparently not ideal trainers for self-management education if the training is given individually during routine consultations. As we described in our introduction, patient education should be well planned, carefully conceived and executed, and focused on patients' needs and problems. Given the amount of time and effort we put in to make our program a success, we think it is fair to say that individual patient education aimed at improving self-management in patients with RA should not be given by health professionals in their daily practice. This kind of individual patient education may need an additional investment to become successful. Either health professionals should invest more time in this kind of education, or one health professional should be made responsible for educating patients and coordinating the activities of all other health professionals. This is a challenge for providers, but this ideal situation can probably not be attained during busy daily practice. As we showed good results with comparable materials during group self-management courses, we feel that group education is probably a better way to improve self-management (2,8). Group education provides more time for each topic and more opportunities for feedback. In addition, there is mutual support among group members, some of whom can also act as models for others (14,15).

The absence of any effect of distributing educational materials on outcome measures in E2 was perhaps to be expected. There is, generally, little evidence to suggest that providing educational information, by itself, can have a beneficial impact on arthritis symptoms (27).

Two explanations may be advanced for the relatively low opinion that the rheumatologists had of the arthritis passport. It provided them with little information they did not already have. In addition, the rheumatologists each had approximately 5 times as many patients to deal with in connection with the intervention as any of the general practitioners, physiotherapists, or visiting nurses, and these patients presented their passports at most or all consultations with them. For the rheumatologists, then, the arthritis passport probably represented a lot of work with little return.

The scores associated with the statements described in Table 5 suggest that coordination of care improved from the physiotherapists' point of view. Following the intervention, the physiotherapists of E1 had more positive views on coordination than those of either of the other groups.

Hagmann and Müller (18) describe the use of a somewhat different arthritis passport, which they refer to as an arthritis card. They report exceptionally positive experiences with it, but do not describe the evaluation or outcome measures. A modified version was used in Emmerich, Germany (19). It was intended not only to improve communication between the patient and various doctors and therapists, but also to stimulate self-management activities. The results were again positive. The passport was well accepted by the health care providers: 89% of the general practitioners who were presented with one either read or wrote in it, though only 55% of the patients actually offered the passports for use. Patients with passports performed more self-management activities than controls who had no passports.

With regard to the acceptance of arthritis passports by patients and health care providers, our findings are comparable with those of the two German studies. Unlike the second, however, our study revealed no effects on self-management activities that might be attributed to the use of the passports. It should also be noted that although our rheumatologists frequently used and, therefore, ostensibly accepted the passport, their opinions of its usefulness were lower than those of the other health care providers involved.

Several other methods have been developed to improve coordination of care. The most commonly used are team care, case management, the critical path method, and the use of computer-based patient records (CPR).

The use of multidisciplinary teams is one of the most comprehensive ways to coordinate care. Such teams usually include a rheumatologist, physiotherapist, occupational therapist, nurse, and social worker (28–33). There are reports of beneficial effects on disease activity and physical, psychological, and socioeconomic functions in RA patients in long-term multidisciplinary outpatient care and inpatient care (28,31,32,34). It has not been possible to demonstrate significant differences between team care and traditional care with regard to efficacy (29,30,33). One of the major disadvantages of team care is that it requires a considerable investment of personnel, effort, time, and money. There is little evidence from our study or from other "team studies" that mere communication among team members enhances outcomes (35).

Case management is team care of a particular type, but with many variations within that type. The common feature is that one person or team is responsible for mobilizing, coordinating, and integrating the necessary care for an individual client or patient (36). Usually the care manager is appointed from among the professionals already involved in the care of the patient.

We found no reports on case management in care for arthritis patients. Jessop and Stein (37) tested a program of outreach and comprehensive health care, in-
volving case management, for children with chronic disorders. Their data suggest that comprehensive care programs may contribute to improvements in psychological and social outcomes among patients in pediatric home care. Addington-Hall et al (38) examined the effects of case management on terminally ill cancer patients and their families. They found that their intervention made little difference in the outcomes that they measured, whether these concerned the patients themselves or their families. As is the case for team care in general, the demands of case management are considerable both financially and in terms of personnel.

A critical path defines an optimal sequencing and timing of tasks performed by physicians, nurses, and other staff in connection with a particular diagnosis or procedure. The purpose is to minimize delay, prevent overuse of resources, and maximize quality of care.

The use of critical paths has been shown to restrict variations in care, facilitate expected outcomes, reduce delays, reduce lengths of stay, and improve cost-effectiveness for hospitalized patients (39). To the best of our knowledge, this tool has not been used for coordinating care outside hospitals. A considerable collaborative effort on the part of the various health care providers involved goes into the development of a critical path: the more extended the setting, the greater the difficulties are likely to be.

Good communication between first- and second-line providers of health care is essential for coordinating the care of individual patients and for ensuring continuity. The purpose of computer-based records (CPR) is to facilitate the exchange of information and make information readily accessible.

Contemporary analyses of CPR technology state that the technical capacity exists to develop both CPR and corresponding robust systems for large-scale use within the next 5 to 10 years (40,41). Current CPR systems maintain large data dictionaries and are suitable for recording all patient data associated with a given event according to time and date. They can retrieve and report data flexibly, allowing multiple views of the data on a given patient or a defined, i.e., user-specifed, population. They can also be used to track clinical and economic outcomes and to identify variations in the patterns of practice among health care providers (42).

The use of CPR is not widespread among physicians in the US (43), but many Dutch general practitioners have started to use them in daily practice (44). The most common connections made are between general practitioners and pharmacies, laboratories, and hospitals. Branger et al (45) compared traditional paper-based communication of laboratory and admission–discharge reports between hospital and general practitioners with electronic data interchange of such information. They concluded that the latter could improve communication between the first and second line of health care. However, the health care network of the RA patient includes physiotherapists, visiting nurses, occupational therapists, social workers, and others who rarely have access to any form of computerized patient registration. CPR is clearly not the most suitable instrument for coordinating care in such a situation.

One of the weak points of CPR is the difficulty of protecting privacy. The arthritis passport is kept by the patient, who therefore has direct control of access to the information in it.

Summarizing, we may conclude that individual education aimed at improving self-management capacities of RA patients during routine consultations has no effect on knowledge, self-efficacy expectations, health behavior, or health status. Group education seems to be a better way of improving self-management.

The effects of group education cannot automatically be achieved in individual education by health care providers during routine consultations. The distribution of educational materials without the involvement of those providing the health care is equally without effect.

Our results indicate that the use of an arthritis passport improves the coordination of care and of education activities, especially concerning physiotherapists. There are as yet no feasible alternatives to the arthritis passport for improving the coordination of care. The strongest arguments in its favor are that it requires only a limited investment, is easy to use, and provides a good insight into the activities of all those involved in the care of the holder. The cooperation of the rheumatologists involved is essential if the arthritis passport is to be used with success. Our results show that this may pose problems, because it is the rheumatologists who have the least to gain.

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REFERENCES

3. Rasker JJ, Cosh JA: The natural history of rheumatoid arthritis over 20 years: clinical symptoms, radiological
34. Vliet Vlieland TPM, Zwinderman AH, Vandenbroucke JP, Breedveld FC, Hazes JMW: A randomized clinical trial of in-patient multidisciplinary treatment versus...