

# Effect of a Collective Educational Program for Patients with Rheumatoid Arthritis: A Prospective 12-month Randomized Controlled Trial

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**ABSTRACT. Objective.** To evaluate the effect on health and functional status of an 8-week group-education program for rheumatoid arthritis (RA) in addition to usual medical care.

**Methods.** All consecutive inpatients and outpatients with RA (ACR criteria) were asked to participate in this randomized, prospective, controlled trial. The educational intervention consisted of 8 weekly ambulatory sessions, each lasting 6 hours. Followup was undertaken after 1 year. The primary criterion for judging effectiveness was the Health Assessment Questionnaire (HAQ) score; secondary criteria consisted of coping, medical knowledge, patient global satisfaction, and quality of life scores before the intervention and after 1 year.

**Results.** We asked 1242 inpatients and outpatients to participate in the study: 208 (16.75%) agreed (104 in each group). At baseline, there was no statistically significant difference between the 2 groups. After 1 year, no statistically significant difference was observed between the 2 groups in change in HAQ score:  $-0.04 \pm 0.46$  (education group) vs  $-0.06 \pm 0.47$  (control group) ( $p = 0.79$ ). Statistically significant differences were found in 3 domains: patient coping ( $-1.22 \pm 5.55$  vs  $-0.22 \pm 3.81$ ;  $p = 0.03$ ), knowledge ( $3.42 \pm 4.73$  vs  $0.73 \pm 3.78$ ;  $p < 0.0001$ ), and satisfaction ( $10.07 \pm 11.70$  vs  $5.72 \pm 13.77$ ;  $p = 0.02$ ), all of which were better for the group attending the education sessions.

**Conclusion.** Despite improvements in patient coping, knowledge, and satisfaction, the education program was not found to be effective at 1 year. There may have been methodological problems relating to the sensitivity of questionnaires and patient selection, and tailored educational interventions should be considered. (First Release June 15 2007; *J Rheumatol* 2007;34:1684–91)

## Key Indexing Terms:

PATIENT EDUCATION  
RHEUMATOID ARTHRITIS

SELF MANAGEMENT  
RANDOMIZED TRIAL

Rheumatoid arthritis (RA) requires multidisciplinary care and patient empowerment. Patient education is generally recognized as an important component of comprehensive management programs for RA<sup>1</sup>. Patient education has been defined as “any set of planned educational activities designed to improve patients’ health behaviors and/or health status”<sup>2</sup>. Educational

strategies may range from the provision of information, as in usual care, to the use of cognitive behavioral strategies, as in educational programs<sup>3–6</sup>. Conflicting results have been obtained concerning the influence of these educational programs on short- or longterm evaluations, patient knowledge, habits, coping strategies, anxiety, quality of life, health, and costs. The clinical significance of the benefits of patient education and the relationship between changes in behavior and changes in health outcomes remain unclear. Short-term effects in program targets are generally observed, whereas longterm changes in health status are not convincingly demonstrated<sup>7</sup>: Riemsma’s metaanalysis<sup>8</sup> of the effects of patient education for RA (31 studies) showed that the benefits of such education were small and short-lived. That report showed significant effects of patient education at first followup for scores on disability, joint counts, patient global assessment, psychological status, and depression. A trend favoring patient education was found for scores on pain. Physician global assessment was not assessed in any of the included studies. The dimensions of anxiety and disease activity showed no significant effects. There was no evidence of longterm benefits.

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effectiveness of a disease-specific self-management program versus a generic self-management program for individuals with arthritis. They showed that specific self-management support is helpful for persons with arthritis and better than generic support at 4 months, but it lessened slightly by 1 year.

Niedermann, *et al*<sup>10</sup> systematically reviewed educational or psychoeducational interventions for patients with RA (randomized controlled trials published between 1980 and July 2002) focusing on longterm effects, especially health status. Short-term effects in program targets were generally observed, whereas longterm changes in health status were not convincingly demonstrated. The 7 educational programs mainly improved knowledge and compliance in the short and long term, but there was no improvement in health status. All 4 psychoeducational programs improved coping behavior in the short term, 2 of them showing a positive longterm effect on physical or psychological health variables.

Patient education programs have become an effective complement to traditional medical treatment but proof of longterm efficacy was not confirmed.

The objective of our randomized, prospective, controlled study at a single center was to evaluate the effect on health and functional status, after 1 year, of an 8-week group-education program for RA in addition to standardized usual medical care, including the provision of RA information booklets, in the RA cohort of the Institute of Rheumatology of our hospital.

## MATERIALS AND METHODS

**Patients.** Between June 2001 and December 2002, all consecutive inpatients and outpatients with RA [criteria of the American College of Rheumatology (ACR)] were considered for enrollment in the trial. Their medical records were screened and they were contacted directly through their rheumatologist or by mail. Eligible patients who agreed to participate attended a baseline visit with one of 2 investigators (JSGLQ or AMB). The exclusion criteria were current juvenile chronic arthritis, Steinbrocker class IV, pregnancy, presence of RA flare, or patient not able to understand the information.

Written informed consent for participation in the trial was obtained before randomization and the trial was approved by the institutional ethics committee.

**Group assignment.** Patients were assigned randomly to one of 2 groups. Patients in the intervention group received multidisciplinary education in addition to usual medical care. They attended 8 weekly 6-hour sessions in groups of 8 to 10 outpatients. After 6 months, patients attended a 4-hour "booster" session.

The control group had usual medical care (verbal information) provided at our institute.

Both groups received 2 information leaflets written by the research team<sup>11</sup>.

**Intervention.** An intensive education program was proposed to deliver a large quantity of information about the disease and the treatment, but also to point the possibilities to reduce pain and stress at home, to understand how to use nonchemical treatment (e.g., physical activities or sports, social and professional behaviors, nutritional advice). The interactive multidisciplinary education program consisted of passive information on the disease, on medical treatment, and on lifestyle advice concerning diet, but also included information on active coping strategies, relaxation, and physical exercise, with the teaching of an exercise program to be followed at home. Sessions were conducted on Thursdays for 6 hours for 8 consecutive weeks. The multidisciplinary team included a rheumatologist and a rehabilitation specialist, a dieti-

cian, and a social assistant, 2 nurses, 2 physiotherapists and 2 occupational therapists. The program employed self-efficacy principles to reduce pain and stress at home, and behavioral modification techniques to change behaviors and improve quality of life by modifying psychological and social contacts (Table 1).

**Randomization.** We contacted a cohort of 1242 outpatients at the same medical center. Patients fulfilling the inclusion criteria who agreed to participate were randomized during the following week. The allocation sequence was generated by randomly placing thoroughly shuffled marked cards into sequentially numbered sealed, opaque envelopes. This process was carried out by a statistics assistant not involved in the trial.

**Followup.** The 12-month evaluation was carried out by 3 independent rheumatologists blind to group allocation (KC, ED, DZ). A 6-month evaluation was done.

**Outcome measures.** Each measure was recorded at baseline (just before the start of the education program for the "active" group), at 6 months, and after 1 year. The main outcome measure was a functional score using the Health Assessment Questionnaire (HAQ), determined before the information intervention, after 6 months, and after 1 year. This self-completed function questionnaire has been translated into French and validated<sup>12</sup>. Total HAQ score ranged from 0 (no functional limitation) to 3 (serious functional limitation). We measured 2 different HAQ scores: the Standard Disability Index (the classic measure with penalties for the use of assistive devices proposed by physiotherapist's education) and the Alternative Disability Index (with no penalties).

The 9 secondary outcome criteria were as follows: (1) Disease Activity Score (DAS28)<sup>13</sup>. (2) Hospital Anxiety and Depression Scale (HADS) score<sup>14</sup>. (3) Arthritis Helplessness Index (AHI) score for Coping<sup>15,16</sup>. (4) Quality of life using the EMIR<sup>17</sup>: score for the short form of the Arthritis Impact Measurement Scale (AIMS2) developed by Guillemain (5 dimensions: 12 physical items, 3 symptomatic items, 5 psychological items, 4 social items, 2 work items)<sup>17</sup>. (5) Functional Assessment of Chronic Illness Therapy – Fatigue scale (FACIT-F) questionnaire score<sup>18</sup>. (6) Physical activity scores: the Baecke questionnaire, validated in French, for sports activity and hobbies<sup>19</sup>. (7) Drug compliance, as assessed with 2 simple questions validated in French for the EURIDISS cohort<sup>20</sup>. (8) Satisfaction with the program, assessed with a section derived from a French hospital questionnaire<sup>21</sup> evaluating the quality of information for each aspect of the program provided by leaflets and/or educational classes. Items were rated on a Likert scale with 5 response categories: very good = 4, good = 3, mediocre = 2, poor = 1, not concerned = 0. An overall perceived satisfaction score for the patient was calculated by summing the scores for all subscales; the final score ranged from 14 to 56. (9) Knowledge of RA, assessed using a 10-item knowledge questionnaire with 5 possible responses to each question, including "don't know." This questionnaire contained 140 multiple choice items on various aspects of RA and its management, adjusted according to the content of the leaflets and education program; the score ranged from 0 to 20.

**Statistical analysis.** The primary outcome was the mean change in HAQ score (score at baseline minus score at 12 months). Assuming a mean change from baseline of –0.05 in the control group and –0.20 in the intervention group (and equal variance of 0.41), a sample size of 118 patients in each group should give 80% power for detecting a difference in means of 0.15, using a 2-tailed 2-group t-test, with p values < 0.05 considered significant.

Baseline characteristics were noted for each group, with qualitative variables expressed as frequencies and percentages, and continuous variables as means and standard deviations. When possible (i.e., at least an available baseline value for the outcome), we handled missing data by the last observation carried forward method. A problem arose when no data were available at baseline. In this situation we do not evaluate data and this is the reason that number of analyzed subjects varied among outcomes. However, when analyzing the primary outcome, all patients were taken into account. The significance of differences in means between the 2 groups was assessed using Student's t-test. Two-tailed tests were carried out and p values < 0.05 were considered significant. All analyses were performed with SAS version 8 (SAS Institute, Cary, NC, USA).

Table 1. The structure and content of the educational intervention program.

1. Rheumatoid arthritis — general information: 1 session
  - Presentation of the multidisciplinary team
  - Normal anatomy of a joint, different types of rheumatism
  - Explanation of the disease, risk factors, disease process, and its consequences
2. Pain coping strategies: 1 session
  - Chronic pain (definition of pain, difference between acute and chronic pain)
  - Pain control (mechanism of action of analgesics drugs, psychological influence, joint protection)
  - Stress control (life changing, positive thinking, leisure time)
  - Coping strategies (energy saving strategy, helpful resources, overcoming fatigue, physical, emotional and environmental strategies)
  - Discussion: patients' individual expectations, medical, physical and emotional strategies
3. Rheumatoid arthritis treatment: 1 session
  - Symptomatic treatment (analgesics, NSAID, corticosteroids) and DMARD (potential objectives, complications, precautions, risk of each treatment and prevention), future treatment
  - Automedication, alternative medicines: possibilities, efficacy and risks of unproven remedies
  - Surgery: benefits and risks of joint implants
4. Nutritional advice: 1 session
  - Theoretical dietetic (role of omega-3 fatty acids, calcium, protein, vitamins)
  - Practical dietetic advice (choice of oils, calcium intake, good and dangerous diets)
  - Organizing travel (vaccination, medication, precautions during travel)
  - Patients' associations
5. Rehabilitation: role of the physiotherapist: 4 sessions (groups of 4 patients)
  - Physical activity (benefits of exercise, specific exercises, fitness programs, assistive devices)
  - Rehabilitation procedure (stretching and strength exercises, choice of sports, physiotherapy)
  - Aquatic program
  - Relaxation (breathing exercises and stretching)
  - Occupational therapy advice (joint protection, splints)
  - Advice from the podiatrist (foot care, choice of shoes, soles)
  - Social advice (improving quality of life and work, legal rights, resources)

## RESULTS

The process used to enroll the target population is illustrated in Figure 1. In total, 1242 patients were contacted by their rheumatologist ( $n = 671$ ) or by mail ( $n = 571$ ): 102 patients (9.86%) met the exclusion criteria (ACR criteria for RA not fulfilled, high level of disease activity, Steinbrocker functional class IV, age < 18 years, current pregnancy); 932 patients declined participation because they lived too far from the hospital ( $n = 316$ ), for professional and/or family reasons ( $n = 398$ ), or due to a lack of motivation for various reasons, including a reluctance to accept the trial setting and a desire to avoid confronting the disease ( $n = 218$ ).

Thus, 1034 did not participate, leaving 208 (16.75%) participants (104 in the control group, 104 in the intervention group).

Twelve patients in the intervention group (11.5%) refused to participate in collective education sessions after randomization. Of the remaining 92 patients in this group, 88 (97.77%) attended the entire program (all 8 sessions).

Eight patients from the intervention group and 10 from the control group were lost to followup at the time of the 1-year evaluation ( $n = 18$ , 8.8%).

*Patient characteristics.* Baseline characteristics of the participating patients are shown in Table 2. At baseline, the 2 groups did not differ significantly in terms of demographic and outcome variables.

Table 3 shows changes in primary outcome measures during the year of followup. No difference in favor of the control

group was observed, as follows. After 1 year, there was no statistically significant difference between the 2 groups in HAQ score:  $-0.04 \pm 0.46$  in the education group versus  $-0.06 \pm 0.47$  in controls ( $p = 0.79$ ). After 1 year, there were no differences between Standard Disability Index and Alternative Disability Index scores, nor was there a difference between the groups at 6 months (Figure 2).

Statistically significant differences were observed in 3 domains (Table 4): patient coping ( $-1.22 \pm 5.55$  intervention group vs  $-0.22 \pm 3.81$  control;  $p = 0.03$ ), knowledge ( $3.42 \pm 4.73$  vs  $0.73 \pm 3.78$ ;  $p < 0.0001$ ), and patient's satisfaction ( $10.07 \pm 11.70$  vs  $5.72 \pm 13.77$ ;  $p = 0.02$ ) — all were better in the group attending education sessions than in the control group.

The intervention had no effect on disease activity and was clinically well tolerated. No differences were found between the 2 groups in terms of behavioral changes (diet and physical exercise) or medical and physical compliance at 1 year.

## DISCUSSION

No difference in favor of the control group was observed in this prospective, randomized, 1-year study. Using last observation carried forward is customary in the field of randomized controlled trials using patient-reported outcomes.

It is difficult to compare the results of our study directly with those of other published studies due to differences in population selection, source of information and education program, outcome measures, and followup periods, but our

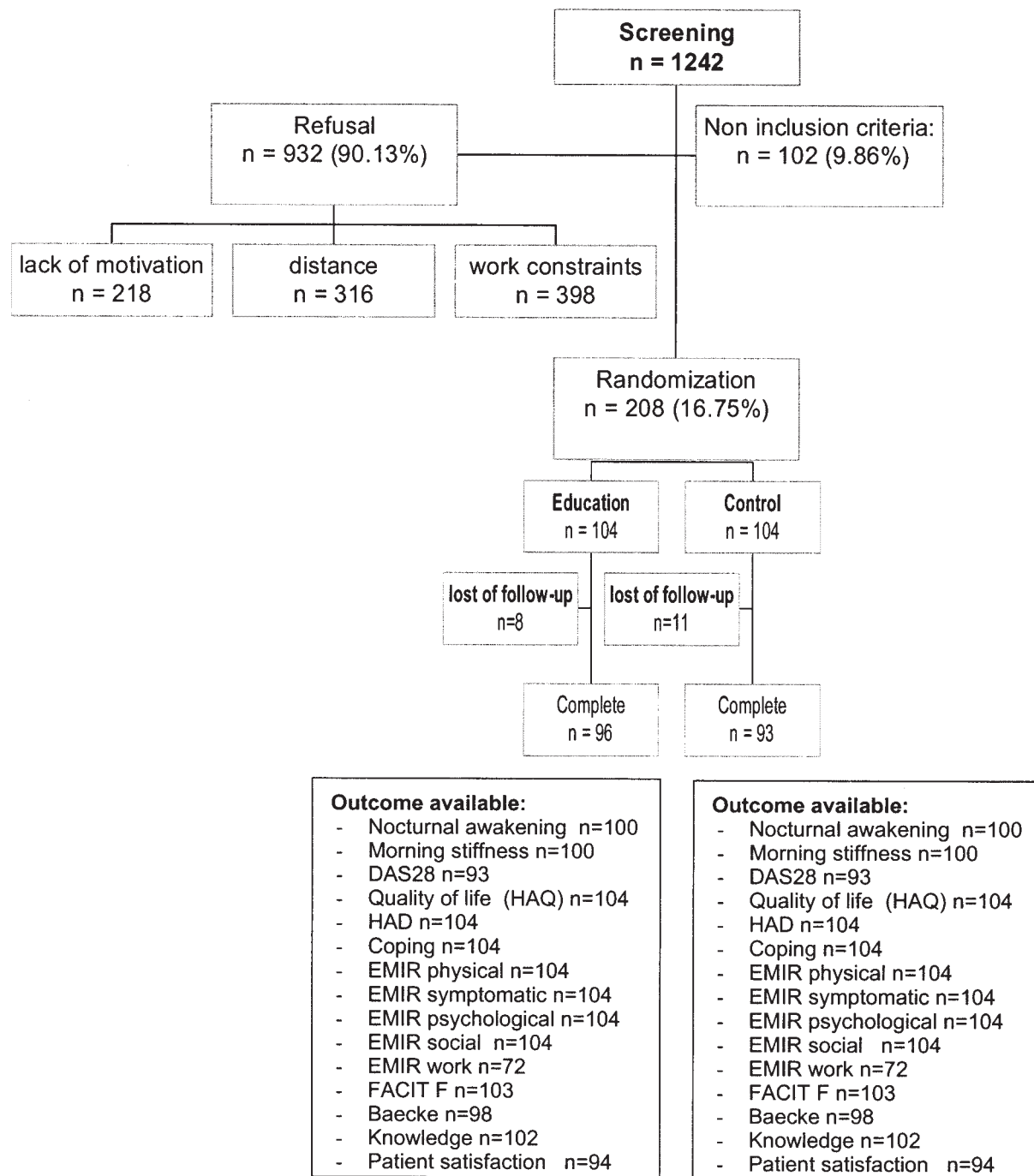


Figure 1. Enrollment of the study groups.

results were comparable to those of the metaanalysis by Riemsma and colleagues (39 studies of the effects of patient education for RA) with no significant effect in terms of HAQ score<sup>8</sup>.

These negative results may be accounted for in part by methodological problems, as follows.

First, HAQ score is not very sensitive to changes in non-pharmacological trials. HAQ score was selected as the pri-

mary criterion because this multidimensional measure of "health status" is the most widely used measure for evaluating the effect of RA treatment on functional ability<sup>32</sup>.

Second, only a small proportion of the patients who were approached to participate fulfilled the inclusion criteria (18%), illustrating major difficulties in recruitment and suggesting that our sample was not representative of the general population of patients with RA. A small number of partici-

Table 2. Characteristics of patients at baseline.

Characteristic	Education Group	Control Group
No. of patients	104	104
Age, yrs, mean $\pm$ SD	55.32 $\pm$ 11.80	54.31 $\pm$ 14.37
Sex, n total (% female)	89 (86.41)	88 (85.44)
Professional status, n (%)	n = 101	n = 101
Full-time job	38 (38.38)	36 (35.29)
Part-time	12 (12.12)	9 (8.82)
Retired	32 (31.68)	39 (38.61)
Unemployed	26 (25.74)	35 (34.65)
"Invalidity"	17 (16.83)	10 (9.90)
Education level, n (%)	n = 101	n = 103
Less than high-school diploma (about 8 yrs)	41 (40.59)	41 (38.83)
High-school diploma ( $\pm$ 12 yrs)	25 (24.75)	25 (24.27)
University (about 16 yrs)	35 (34.65)	37 (35.92)
Family situation alone at home, n (%)	n = 103	n = 103
Disease duration, yrs, mean $\pm$ SD	34 (33.01)	41 (39.81)
Rheumatoid factor-positive, n (%)	n = 100	n = 99
Steinbrocker functional class, n (%)	11.85 $\pm$ 9.44	14.25 $\pm$ 10.27
1	n = 95	n = 97
2	71 (74.74)	77 (79.38)
3	n = 101	n = 101
No. of DMARD, mean $\pm$ SD	17 (16.83)	21 (20.79)
Modification during last 3 mo, n (%)	71 (70.30)	61 (60.40)
1	13 (12.87)	19 (18.81)
2	n = 102	n = 103
3	1.43 $\pm$ 0.64	1.30 $\pm$ 0.64
4	n = 95	n = 98
5	82 (86.32)	87 (88.78)

Table 3. Baseline results and changes after 1 year of followup. Data are mean  $\pm$  SD.

Result	Baseline		Change (absolute variation)		p
	Education Group, n = 102	Control Group, n = 104	Education Group, n = 102	Control Group, n = 104	
HAQ score with weighting	1.22 $\pm$ 0.67	1.12 $\pm$ 0.69	-0.04 $\pm$ 0.46	-0.06 $\pm$ 0.47	0.7910
HAQ score, unweighted	1.04 $\pm$ 0.68	0.99 $\pm$ 0.68	-0.07 $\pm$ 0.46	-0.07 $\pm$ 0.47	0.9444

pants were in fulltime paid employment, and professional and/or family constraints were the main reason for refusing to participate. This suggests that this educational program was too time-consuming for patients in employment or with family constraints.

Third, the study population had a long disease duration, 11.85  $\pm$  9.44 years in the education group and 14.25  $\pm$  10.27 years in controls, and a high level of medical knowledge (scored 0–20): 15.89  $\pm$  5.20 (education group) and 16.48  $\pm$  5.24 (controls). This was a pragmatic study and the study population may not be representative of all persons with RA, particularly in terms of age and duration of disease, and good level of information at baseline; it would probably be more interesting to propose such a program to patients with early RA.

Lastly, 12 of the 104 patients allocated to the intervention group refused to attend the educational sessions after randomization and agreed only to attend the followup visits.

However, this multidisciplinary, collective, education program had statistically significant positive effects in 3 domains (evaluated as secondary endpoints), patient coping (-1.22  $\pm$  5.55 vs -0.22  $\pm$  3.81;  $p = 0.03$ ), knowledge (3.42  $\pm$  4.73 vs 0.73  $\pm$  3.78;  $p < 0.0001$ ), and satisfaction (10.07  $\pm$  11.70 vs 5.72  $\pm$  13.77;  $p = 0.02$ ), and was safe. The results are probably due to our multifacet program, which offered information and education about the disease and specific treatment, but also offered a physical program, nutrition advices, social and psychological resources, and coping strategies. However, according to the number of tests performed (multiple outcomes criteria), we cannot exclude that the observed results could be due to type I error.

"Coping" is defined by Lazarus<sup>11</sup> as "Constantly changing cognitive and behavioral efforts to manage, reduce or tolerate external and/or internal demands that are appraised as taxing or exceeding the resources of the person." Coping is a com-



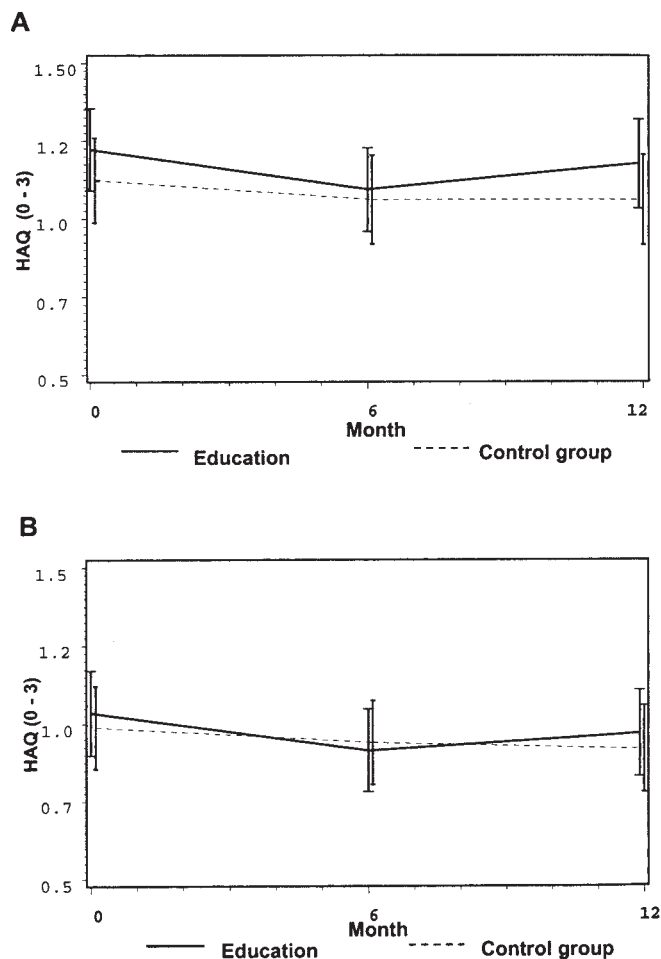


Figure 2. HAQ scores with weighting (A) and without weighting (B) in the education group and the control group. HAQ values shown as means. Vertical bars represent standard error of the mean.

plex, multidimensional, dynamic, and adaptive process and its assessment requires improvement. Patient coping was assessed in this study with the Arthritis Helplessness Index, which is short and easy to use. It is now widely accepted that coping based on a positive/optimistic attitude can enhance quality of life, facilitate compliance with treatment, and have a favorable effect on disease progression. The patient's understanding of and beliefs concerning chronic illness affect adjustment, vigilance to signs of acute flare, compliance with treatment, and changes in lifestyle. Coping strategies based on avoidance, fatalism, passive acceptance, withdrawal from others, blaming others, self-blame, and efforts to forget or deny the existence of the disease are associated with poor adjustment to chronic illness. Improvements in coping may lead to improvements in health outcome in patients with RA<sup>23</sup>, as avoidant and resigned coping strategies were partly responsible for the relationship between symptom identity and illness outcome. In psoriasis, the patient's perception of the illness and coping strategy are predictors of functional status<sup>24</sup>. The

educational intervention had no effect on the level of psychological distress in patients with RA, as measured by Hospital Anxiety and Depression Scale score, although other studies have reported an effect on anxiety and depression<sup>25,26</sup>. Maladaptive coping ("catastrophizing") has been shown to influence health outcome in women with gastrointestinal disorders<sup>27</sup> and to decrease physical functioning, energy, and social functioning in individuals with HIV/AIDS<sup>28</sup>. Moreover, some studies have shown that coping response is a significant mediator and predictor of 3 outcome variables: depression, life satisfaction, and self-related health<sup>29</sup>.

Interactions between team members and patients are an important part of both patient satisfaction and overall quality of care: satisfaction in the intervention group was confirmed by high levels of attendance once the program had been initiated.

Improvements in the patients' knowledge following educational interventions have been reported<sup>30</sup>; such improvements may empower patients with RA by increasing the desire to make their own decisions, as suggested by Neame, *et al*<sup>31</sup>. Patient empowerment is associated with higher levels of satisfaction<sup>32</sup> and improvements in health outcome<sup>33</sup>; significant changes in behavior were observed after the intervention, and drug compliance was particularly high at baseline.

Despite improvements in patient coping, knowledge, and satisfaction, after 1 year, this educational intervention failed to improve the HAQ quality of life scores (measured by EMIR<sup>17</sup>, the score for the short form of the AIMS2), lifestyle, and health outcomes findings of patients with RA over those for patients given usual medical care, including information booklets. The lack of improvement for health outcomes we observed may have been the result of methodological problems (i.e., questionnaire sensitivity and patient selection), and more specifically tailored educational interventions should be considered. One major problem in multidisciplinary educational interventions is that classical outcome measures may underestimate the benefit of the intervention.

This 8-week educational intervention was time-consuming, and other types of education, such as intensive courses during a week spent at a spa or over 4 days during a short period of hospitalization, could be considered. The optimization of collective multidisciplinary education sessions, with an initial personalized interview with a nurse responsible for patient information, might improve the quality of personal education, with advice tailored to the patient according to disease stage, patient characteristics, and the goals of the program. Motivational strategies are needed to convince RA patients to adopt appropriate lifestyle changes. Regular reinforcement from all healthcare professionals could provide a low-cost first step toward encouraging patients to take responsibility, and leading to increased compliance, which should improve health outcomes. Future studies to examine intensive interventions in people with low knowledge about RA or with no prior education intervention especially when symptoms first begin, might be encouraged.

Table 4. Baseline results and changes after 1 year of followup. Data are means  $\pm$  SD.

Result	Baseline		Change (absolute variation)		p
	Education Group	Control Group	Education Group	Control Group	
Nocturnal awakening	n = 100 0.93 $\pm$ 1.24	n = 100 0.94 $\pm$ 1.26	n = 100 -0.32 $\pm$ 1.12	n = 100 -0.32 $\pm$ 1.29	1.0000
Morning stiffness	n = 99 52.76 $\pm$ 79.21	n = 100 44.90 $\pm$ 69.99	n = 99 -23.65 $\pm$ 84.43	n = 100 -18.21 $\pm$ 64.13	0.6099
DAS28	n = 86 4.32 $\pm$ 1.31	n = 93 4.14 $\pm$ 1.57	n = 86 -0.48 $\pm$ 1.34	n = 93 -0.58 $\pm$ 1.58	0.6713
Quality of life (HAQ score)	n = 102 1.22 $\pm$ 0.67	n = 104 1.12 $\pm$ 0.694	n = 102 -0.04 $\pm$ 0.46	n = 104 -0.06 $\pm$ 0.47	0.7910
Anxiety-depression HADS <sup>14</sup>	n = 102	n = 104	n = 102	n = 104	
Anxiety	6.16 $\pm$ 2.95	6.21 $\pm$ 3.09	0.05 $\pm$ 3.09	0.14 $\pm$ 2.41	0.8059
Depression	9.90 $\pm$ 4.36	9.48 $\pm$ 4.21	-1.01 $\pm$ 3.23	-0.48 $\pm$ 2.82	0.2122
Coping	n = 102 18.65 $\pm$ 5.06	n = 104 17.63 $\pm$ 4.56	n = 102 -1.22 $\pm$ 5.55	n = 104 0.22 $\pm$ 3.81	0.0319
Quality of life, EMIR <sup>17</sup>					
Physical	n = 102 24.55 $\pm$ 7.10	n = 104 22.61 $\pm$ 5.79	n = 102 0.06 $\pm$ 5.69	n = 104 0.33 $\pm$ 5.06	0.7211
Symptomatic	n = 101 8.89 $\pm$ 3.41	n = 104 7.69 $\pm$ 3.53	n = 101 -1.00 $\pm$ 3.34	n = 104 -0.02 $\pm$ 3.13	0.0311
Psychological	n = 101 13.84 $\pm$ 3.85	n = 104 13.28 $\pm$ 4.23	n = 101 -0.87 $\pm$ 3.34	n = 104 -0.38 $\pm$ 3.60	0.3174
Social	n = 102 12.02 $\pm$ 2.37	n = 104 12.43 $\pm$ 2.49	n = 102 -0.26 $\pm$ 2.24	n = 104 -0.21 $\pm$ 2.35	0.8684
Work	n = 79 4.68 $\pm$ 2.46	n = 72 4.40 $\pm$ 2.60	n = 79 0.14 $\pm$ 2.57	n = 72 -0.06 $\pm$ 2.62	0.6453
FACIT/F <sup>18</sup>	n = 101 20.41 $\pm$ 9.50	n = 103 19.43 $\pm$ 9.29	n = 101 -0.02 $\pm$ 7.05	n = 103 0.09 $\pm$ 6.85	0.9124
Physical activity, Baecke questionnaire <sup>19</sup> (sports activity + hobbies)	n = 98 16.37 $\pm$ 4.62	n = 98 17.31 $\pm$ 7.96	n = 98 -2.43 $\pm$ 4.89	n = 98 -3.92 $\pm$ 8.30	0.1280
Knowledge	n = 101 15.89 $\pm$ 5.20	n = 102 16.48 $\pm$ 5.24	n = 101 3.42 $\pm$ 4.73	n = 102 0.73 $\pm$ 3.78	< 0.0001
Patient's satisfaction	n = 98 36.19 $\pm$ 9.18	n = 94 31.37 $\pm$ 11.33	n = 98 10.07 $\pm$ 11.70	n = 94 5.72 $\pm$ 13.77	0.0192

Our results showing improvements in coping, satisfaction, and knowledge are encouraging and future studies are required to identify the most appropriate type of educational program for RA management.

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## REFERENCES

- American College of Rheumatology Subcommittee on Rheumatoid Arthritis Guidelines. Guidelines for the management of rheumatoid arthritis: 2002 Update. *Arthritis Rheum* 2002;46:328-46.
- Tucker M, Kirwan J. Does patient education in rheumatoid arthritis have therapeutic potential? *Ann Rheum Dis* 1991;50:422-8.
- Lorig K. A comparison of lay-taught and professional-taught arthritis self-management courses. *J Rheumatol* 1986;13:763-7.
- Lindroth Y, Brattstrom M, Bellman I, et al. A problem-based education program for patients with rheumatoid arthritis: evaluation after 3 and 12 months. *Arthritis Care Res* 1997;10:325-32.
- Parker J, Frank R, Beck N, et al. Pain management in rheumatoid arthritis patients. A cognitive-behavioral approach. *Arthritis Rheum* 1988;31:593-601.
- Taal E, Riemsma RP, Brus HL, Seydel ER, Rasker JJ, Wiegman O. Group education for patients with rheumatoid arthritis. *Patient Educ Couns* 1993;20:177-87.
- Schrieber L, Colley M. Patient education. *Best Pract Res Clin Rheumatol* 2004;18:465-76.
- Riemsma RP, Kirwan JR, Taal E, Rasker JJ. Patient education for adults with rheumatoid arthritis. *Cochrane Database Syst Rev* 2003;CD003688.
- Lorig K, Ritter PL, Plant K. A disease-specific self-help program compared with a generalized chronic disease self-help program for arthritis patients. *Arthritis Rheum* 2005;53:950-7.
- Niedermann K, Fransen J, Knols R, Uebelhart D. Gap between short- and long-term effects of patient education in rheumatoid arthritis patients: a systematic review. *Arthritis Rheum* 2004;51:388-98.
- La polyarthrite en 100 questions; 1998. Vie quotidienne et Polyarthrite rhumatoïde; 2005. AP-HP et Institut de rhumatologie de l'hôpital Cochin; Ouvrages collectifs. Paris: Editions NHA Communication.
- Guillemin F, Brianchon S, Pourel J. Mesure de la capacité fonctionnelle dans la polyarthrite rhumatoïde: adaptation française du Health Assessment Questionnaire (HAQ) [Measurement of the functional capacity in rheumatoid polyarthritis: a French adaptation

- of the Health Assessment Questionnaire (HAQ)]. *Rev Rhum Mal Osteoartic* 1991;58:459-65.
13. Smolen JS, Breedveld FC, Eberl G, et al. Validity and reliability of the twenty-eight-joint count for the assessment of rheumatoid arthritis activity. *Arthritis Rheum* 1995;38:38-43.
  14. Lepine JP, Godchau M, Brun P. Anxiety and depression in inpatients. *Lancet* 1985;2:1425-6.
  15. Nicasio PM, Wallston KA, Callahan LF, Herbert M, Pincus T. The measurement of helplessness in rheumatoid arthritis. The development of the arthritis helplessness index. *J Rheumatol* 1985;12:462-7.
  16. DeVellis RF, Callahan LF. A brief measure of helplessness in rheumatic disease: the helplessness subscale of the Rheumatology Attitudes Index. *J Rheumatol* 1993;20:866-9.
  17. Guillemain F, Coste J, Pouchot J, Ghezail M, Bregeon C, Sany J. The AIMS2-SF: a short form of the Arthritis Impact Measurement Scales 2. French Quality of Life in Rheumatology Group. *Arthritis Rheum* 1997;40:1267-74.
  18. Cella D, Yount S, Sorensen M, Chartash E, Sengupta N, Grober J. Validation of the Functional Assessment of Chronic Illness Therapy Fatigue Scale relative to other instrumentation in patients with rheumatoid arthritis. *J Rheumatol* 2005;32:811-9.
  19. Baecke JAH, Burema J, Frijters JE. A short questionnaire for the measurement of habitual physical activity in epidemiological studies. *Am J Clin Nutr* 1982;36:932-42.
  20. Viller F, Guillemain F, Briancon S, Moum T, Suurmeijer T, van den Heuvel W. Compliance to drug treatment of patients with rheumatoid arthritis: a 3 year longitudinal study. *J Rheumatol* 1999;26:2114-22.
  21. Pourin C, Tricaud-Vialle S, Barberger-Gateau P. Validation d'un questionnaire de satisfaction des patients hospitalisés. *J Econ Med* 2003;3:167-81.
  22. Fries JF, Spitz P, Kraines RG, et al. Measurement of patient outcome in arthritis. *Arthritis Rheum* 1980;23:137-45.
  23. Scharloo M, Kaptein AA, Weinman J, et al. Patients' illness perceptions and coping as predictors of functional status in psoriasis: a 1-year follow-up. *Br J Dermatol* 2000;142:899-907.
  24. Scharloo M, Kaptein AA, Weinman JA, Hazes JM, Breedveld FC, Rooijmans HG. Predicting functional status in patients with rheumatoid arthritis. *J Rheumatol* 1999;26:1686-93.
  25. Carlisle AC, John AM, Fife-Schaw C, Lloyd M. The self-regulatory model in women with rheumatoid arthritis: relationships between illness representations, coping strategies, and illness outcome. *Br J Health Psychol* 2005;10:571-87.
  26. Mullen PD, Laville EA, Biddle AK, Lorig K. Efficacy of psycho-educational interventions on pain, depression, and disability in people with arthritis: a meta-analysis. *J Rheumatol* 1987;14 Suppl 15:33-9.
  27. Drossman DA, Leserman J, Li Z, Keefe F, Hu YJ, Toomey TC. Effects of coping on health outcome among women with gastrointestinal disorders. *Psychosom Med* 2000;62:309-17.
  28. Vosvick M, Koopman C, Gore-Felton C, Thoresen C, Krumboltz J, Spiegel D. Relationship of functional quality of life to strategies for coping with the stress of living with HIV/AIDS. *Psychosomatics* 2003;44:51-8.
  29. Lim L, Nathan P, O'Brien-Malone A, Williams S. A qualitative approach to identifying psychosocial issues faced by bipolar patients. *J Nerv Ment Dis* 2004;192:810-7.
  30. Giraudet-Le Quintrec JS, Kerboull L, Guyen-Vaillant MF, et al. Education for outpatients with rheumatic diseases: Evaluation of short term and medium term results. *Rev Rhum Engl Ed* 1996;63:469-74.
  31. Neame R, Hammond A, Deighton C. Need for information and for involvement in decision making among patients with rheumatoid arthritis: a questionnaire survey. *Arthritis Rheum* 2005;53:249-55.
  32. Brekke M, Hdahl P, Kvien TK. Involvement and satisfaction, a Norwegian study of health care among 1024 patients with rheumatoid arthritis and 1509 patients with chronic non inflammatory musculoskeletal pain. *Arthritis Rheum* 2001;45:8-15.
  33. Stewart M, Brown JB, Donner A, et al. The impact of patient-centered care on outcomes. *Fam Pract* 2000;49:796-804.