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Influence of Patient Education on Exercise Compliance in Rheumatoid Arthritis: A Prospective 12-month Randomized Controlled Trial

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ABSTRACT. ***Objective.*** To determine the effect of education on the exercise habits of patients with rheumatoid arthritis (RA) after 6 and 12 months.

Methods. We studied 208 outpatients recruited between June 2001 and December 2002. This was a prospective controlled randomized trial. The active group received a multidisciplinary education program, including training in home-based exercises and guidelines for leisure physical activity (PA). The control group received a booklet added to usual medical care. Compliance with home-based exercises was defined as a practice rate ≥ 30% of the prescribed training. Compliance with leisure PA was defined as ≥ 20% increase in Baecke questionnaire score. Additional assessments involved possible predictors of compliance and changes with regard to the compliance.

Results. At 6-month followup, home-based exercise and leisure PA compliance were significantly higher [13.5% vs 1%, respectively (p = 0.001); and 28.2% vs 13.8% (p = 0.02)], but were not at 12 months. Predictors of leisure PA compliance at 6 months included participating in the active group (odds ratio 2.74, 95% CI 1.17 to 6.38) and previous low leisure PA (OR 6.01, 95% CI 2.47 to 14.61), with decreased fatigue (FACIT-F mean –2.94 ± 8.04 vs –0.1 ± 7.25 for noncompliant subjects; p = 0.04) and improved psychological status (Arthritis Impact Measurement Scale mean –1.25 ± 3.12 vs 0.11 ± 3.39; p = 0.03).

Conclusion. Education of patients with RA may increase compliance especially with leisure PA, particularly when it is poor at baseline, but these effects are limited and short-term. (First Release Dec 15 2007; J Rheumatol 2007;35:216–23)

Key Indexing Terms:
RHEUMATOID ARTHRITIS EDUCATION PHYSICAL ACTIVITY
EXERCISE COMPLIANCE RANDOMIZED TRIAL

Regular exercise is encouraged among healthy people to prevent death and disease from cardiovascular disease, osteoporosis, anxiety, and depression[1]. Thus, people with rheumatoid arthritis (RA) who have increased susceptibility for these comorbid conditions[2-4] may benefit from regular exercise[5] and may be encouraged to exercise. However, the reduced physical capacity found frequently among patients with RA may be attributable in part to inadequate levels of physical activity (PA). Indeed, traditionally, exercise restriction has been recommended because of concerns about aggravating joint inflammation and accelerating joint damage in these patients[6].

Recent systematic reviews[7] suggest that patients with RA could benefit from regular physical exercise, including dynamic and weight-bearing exercises, and could improve aerobic capacity, muscle strength, functional ability, and psychological well-being with moderate-intensity exercise without detrimental effects on disease. The American College of Rheumatology (ACR) recommended regular participation in dynamic exercise programs in its recent update of treatment guidelines for RA[8].

Therefore, development of educational programs and strategies is needed to promote PA for patients with RA. Supervised training, such as that in the Rheumatoid Arthritis

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Patients In Training (RAPIT) study, is not cost-effective as compared with usual care[9]. Exercise programs with less therapist supervision and more self-care may reduce costs[10,11]. Education interventions for RA patients have shown beneficial effects on health behavior and physical and psychosocial health status[11,12]. Higher self-efficacy, which is amenable through an education program[11], is associated with better health status[13] and lower arthritis-related costs. But data on changes in leisure PA after such interventions are sparse. Disease activity, disability, or medication have not been identified as predictors of loss of performed leisure activities that occurs in early RA[14,15], and other factors, such as psychosocial status, may be important for predicting changes in leisure activities.

These concerns prompted us to conduct a post-hoc analysis of a trial aimed at evaluating the effect of an educational program on functional disability in patients with RA[16]. This randomized controlled trial aimed to assess compliance with a home-based exercise program and recommendations for leisure PA delivered through a multidisciplinary educational intervention added to usual medical care. As well, we sought to investigate baseline physical and psychological determinants of compliance with exercise in RA patients, and to assess the health changes in participants who comply with exercise and leisure PA recommendations.

MATERIALS AND METHODS

Study design. Our randomized controlled prospective study was a single-center trial of 12 months' duration. The trial was approved by the local ethics committee, and we obtained informed consent from patients for participation before randomization.

Patients. The medical records of RA patients at our institution were screened between June 2001 and December 2002, and patients were contacted by mail or asked by their physicians to participate in the trial.

Eligible patients had RA according to the 1987 revised ACR criteria[17], were between 18 and 80 years of age, had received stable dosages of disease-modifying drugs in the previous 3 months, and had a Steinbrocker functional status of class I, II, or III[18]. Patients were excluded if their previous general health conditions disallowed their participation in an exercise program, they were pregnant, or they misunderstood the French language. Eligible patients who refused to participate were asked to explain their decision by selecting one of the following items: lack of motivation, remote from home, time-consuming intervention, or other personal reasons. Eligible patients who agreed to participate attended a baseline visit with one of 2 investigators (JSGLQ or AMB).

Baseline evaluation. At the baseline medical visit, data were collected on medical history, disease management, and leisure behaviors. Disease activity was assessed by the Disease Activity Score (DAS28)[19]. The 50-foot walk test was performed[20].

Additionally, this multidimensional evaluation involved patients answering several questionnaires in their French version: the functional Health Assessment Questionnaire (HAQ)[21,22] validated in French, the Hospital Anxiety and Depression Scale (HADS)[23], the Arthritis Helplessness Index (AHI) for coping measurement[24], the short-form of the Arthritis Impact Measurement Scale (AIMS2)[25,26] validated in French, the Functional Assessment of Chronic Illness Therapy–Fatigue (FACIT-F) questionnaire[27,28], and the Baecke questionnaire[29,30] validated in French, which assesses usual leisure-time PA.

Study procedure. *Randomization*. In the week following the baseline visit, patients were assigned randomly to the active or control groups. The allocation sequence was generated by random placement of thoroughly shuffled marked cards into sequentially numbered, sealed, opaque envelopes by a statistics assistant not involved in the trial.

The active group participated in a multidimensional educational program added to usual medical care. The control group received usual care. All patients received 2 information booklets[31,32].

Educational program (active group). The educational program was delivered within the month following the randomization and included 8 weekly, 5-hour sessions for outpatients. Participants were organized into classes of 8 to 10 for the sessions. Four sessions consisted of comprehensive information about RA and its medical management. Four sessions were devoted to physical program and were conducted by health professionals. Each session was initiated by a physician's lecture focused specifically on guidelines for practicing adequate PA and a discussion that aimed to enhance positive attitudes and beliefs related to exercise (1 hour). Tailored advice and individual approaches were provided to offset physical and psychological barriers to exercise, instructing patients on how to incorporate moderate PA into their usual day, find enjoyable and attainable activities, and modify the program according to their current health because of the variable course of RA. Then participants were split into subgroups to participate in workshops. The occupational therapist's intervention (1 hour) included education on joint protection positioning, proper footwear, and use of splints and adaptive aids that participants could test. The physical therapist's intervention (1 hour) included the practice of the home-based exercise and aerobic activities such as cycling. After a break, the participants attended classes devoted to aquatic (1 hour) or relaxation training (1 hour).

The home-based exercise program included 10 exercises: 3 hand and wrist range-of-motion exercises; 5 isometric strengthening exercises to reinforce limb muscles with elastic bands; a foot-roll exercise involving a tennis ball; and 1 towel-grabbing exercise to recruit plantar muscles. For each exercise, a set of 10 repetitions was prescribed. From our previous experience[33], participants were encouraged to practice at least and alternatively 3 exercises each day according to their joint involvement and their current physical activities. The program could be performed in one daily session or split into short sessions throughout the day.

The home-based exercise program and leisure PA recommendations were described in the booklets given to both active and control groups.

After a 6-month followup assessment, patients attended a meeting (at 6 months after the first educational session) to reinforce the program.

Usual medical care (control group). Usual medical care was given by the rheumatologist in charge of the patient and could include individual physical therapy only if considered necessary by the attending physician.

Followup visits. Followup visits were performed by 3 physicians blinded to group assignment and independent physicians (KC, ED, DZ) 6 and 12 months after the randomization. The physicians collected the exercise sheets from each patient but did not check whether patients could actually perform the exercises.

Exercise compliance assessment at a given visit. The compliance rate for home-based exercise was measured as described[33]. The mean weekly practice was calculated as the proportion of self-reported mean weekly number of exercises to total number of exercises included in the home-based program. To be compliant, each participant had to have a compliance rate $\geq$ 30%, meaning at least a daily mean practice of a set of 3 different exercises whatever the exercises performed and have disrupted training less than 1 month before the 6-month followup visit and less than 2 months before the 12-month followup visit.

Leisure PA compliance was measured by comparing the baseline and followup (6- or 12-month) level of leisure PA as assessed by the Baecke questionnaire. Because identification of a minimal clinically important difference is lacking for the Baecke score, we decided that compliant participants had to have increased their score by at least 20% over that at baseline. This threshold was chosen because of its clinical relevance and out of respect to the 5-point scale of the Baecke questionnaire.

Sample size calculation. The sample size calculation was based on the mean

change in HAQ score (score at baseline minus score at 12 months) because the HAQ was the primary outcome of the main study[16]. Assuming a mean change from baseline of –0.05 for the control group and –0.20 for the intervention group (and equal variance, 0.41), a sample size of 118 patients in each group would provide 80% power to detect a difference in means of 0.15, assuming a common standard deviation of 0.41, using a 2-group t-test with a 0.05 2-sided significance level.

Statistical analysis. Statistical analysis was conducted in 4 consecutive steps. The first compared the baseline characteristics of patients per treatment group. Quantitative variables were compared by use of Student t-test and categorical variables by the chi-square test. The second step evaluated the effect of the educational intervention on the 2 main outcome variables: proportion of patients compliant with home-based exercise and leisure PA by treatment group (see description of the outcome variable). For this purpose, we used the chi-square test. The first- and second-step analyses tested data obtained at 6 and 12 months.

The third step aimed to explore predisposing factors for leisure PA compliance at 6 months. We conducted both uni- and multivariate analysis (logistic regression), with the independent variable, leisure PA compliance, defined as a dichotomous variable (yes/no). The potential predisposing factors (independent variables) were defined as dichotomous, with the median used as a cutoff. The factors were patient educational intervention (1 = active group, 0 = control group); living alone at home (1 = yes, 0 = no); DAS28 (1 ≤ 4.2, 0 = no); Steinbrocker functional class (1 = class 1, 0 = class 2 or 3); HAQ (1 ≤ 1.2, 0 = no); 50-foot walk time (1 = time < 10 s, 0 = no); baseline level of usual leisure PA score as assessed by the Baecke questionnaire (1 ≤ 16 score, 2 ≥ 16); HADS anxiety score (1 ≤ 6, 0 = no); HADS depression score (1 ≤ 10, 0 = no); AHI coping score (1 ≤ 18, 0 = no); FACIT-F score (1 ≤ 18, 0 = no); AIMS physical subscore (1 ≤ 22, 0 = no); and AIMS psychological subscore (1 ≤ 8, 0 = no). The variables with $p < 0.20$ after univariate analysis were entered into the multivariate analysis. For the predisposing factors revealed by the multivariate model, the median cutoff was selected before calculation of an odds ratio.

The fourth step involved comparing changes in outcome variables during the first 6 months in terms of compliance. We classified patients as compliant or not using the same definition as above. The outcome variables were 50-foot walk time and scores on the DAS, HAQ, AIMS physical domain, AIMS psychological domain, AIMS social domain, HADS anxiety and depression, AHI coping, and FACIT-F.

All analyses used SAS version 8 (SAS Institute Inc., Cary, NC, USA) and $p < 0.05$ was considered significant.

RESULTS

Patients and study course. The process used to enroll the target population and the patient characteristics have been described[16]. Among 1242 patients invited to participate, 932 (90.1%) refused (316 lived too far from the institute or transportation was a problem, 398 found the study too time-consuming, 218 lacked motivation) and 102 (9.9%) were not eligible after screening (Figure 1). Thus, 208 patients were included in the study. Among them, 165 were recruited via their physician. The mean age was 54.7 ± 13.1 years; disease duration at enrolment was 12.7 ± 9.8 years. Most patients had a Steinbrocker functional class II score (72.6%) and no current occupation (65.4%). After randomization, the active (educated) and control groups each included 104 participants. Characteristics of the 2 groups were similar (Table 1).

Eight patients from the active group and 11 from the control group were lost to followup at 12-month evaluation (n = 9, 4%).

Twelve patients allocated to the active group refused to attend the educational classes. Their baseline characteristics did not differ from those of the participants. Among the 92 patients who began the education procedure, the attendance rate was excellent (97.8%). The physical training was well tolerated, and no participant experienced a clinical detrimental effect related to prescribed exercises. Thus, we gathered data on 6-month home-based exercise compliance for 180 patients and 6-month leisure PA compliance for 172 patients.

Compliance rates (Table 2). 6-month compliance.

Home-based exercise compliance: 12 patients (13.5%) in the active group and 1 (1.1%) in the control group complied with the home-based exercise program as defined ($p = 0.002$), the compliance rate being 15.8% ± 24.9% and 4.8% ± 18.2%, respectively ($p < 0.0001$).

Leisure PA compliance: 24 patients (28.2%) in the active group and 12 (13.8%) in the control group were compliant at 6 months (i.e., they increased their leisure PA by at least 20%; $p = 0.02$). The level of leisure PA was significantly increased at 6-month followup only in the active group (+15.2% ± 34.9% vs –0.20% ± 24.8%; $p = 0.0001$).

12-month compliance.

Home-based exercise compliance: Only 7 patients (7.9%) in the active group and 3 (3.4%) in the control group were compliant with home-based exercise at 12-month followup ($p = 0.19$). The 12-month compliance rate was 11.8% ± 25.5% versus 4% ± 16%, respectively ($p < 0.0001$).

Leisure PA compliance: 8 patients (9.2%) in the active group and 7 (7.1%) in the control group were leisure PA compliant at 12-month followup ($p = 0.61$), and the level of leisure PA was –10% ± 31.7% in the active group versus –16.8% ± 26.2% in the control group ($p = 0.10$).

Predictors of 6-month leisure PA compliance. Of the 13 variables assessed in the univariate analysis (Table 3), 3 were related to leisure PA compliance: participating in the active group ($p = 0.02$), having a low baseline level of PA ($p < 0.0001$), and having good psychological status ($p = 0.04$). Five variables (patient educational intervention, Steinbrocker functional class, baseline level of usual leisure PA score, AIMS physical subscore, and AIMS psychological subscore) were entered in the multivariate model. The multivariate analysis identified only 2 variables as predisposing factors: participating in the active (educated) group (odds ratio 2.74, 95% confidence interval 1.17 to 6.38) and having a low baseline level of leisure PA [i.e., a Baecke score < 16 (OR 6.01, 95% CI 2.47 to 14.61)].

Effect of home-based exercise and leisure PA compliance on clinical outcomes (Table 4). Compliance with home-based exercise and selected outcome change were not associated. However, we found an association between compliance with leisure PA and 2 outcomes: AIMS psychological domain (mean –1.25 ± 3.12 vs 0.11 ± 3.39 for noncompliant patients, $p = 0.03$, a negative score indicating better psychological outlook) and fatigue on the FACIT vitality scale (mean –2.94 ±

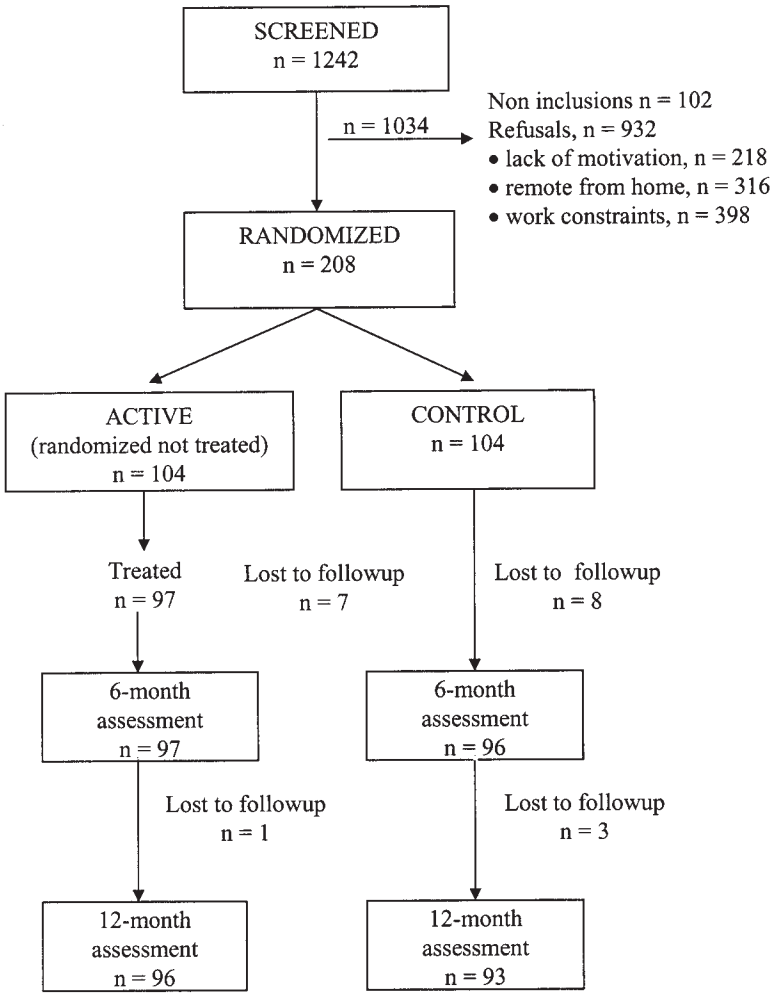

Figure 1. Progress of participants included in the trial.

Table 1. Baseline characteristics of patients with RA assigned to an active group (participated in an educational program about exercise) and control groups to determine compliance with home-based exercises and leisure physical activity. Differences were examined by chi-square or Mann-Whitney U test when appropriate.

Feature	Active Group, n = 104	Control Group, n = 104
Age, yrs, mean ± SD	55.32 ± 11.80	54.31 ± 14.37
Female, %	89.86	88.85
Weight, kg, mean ± SD	65.35 ± 13.98	66.25 ± 16.59
Positive for rheumatoid factor, %	74.74	79.38
Duration of RA, yrs, mean ± SD	11.85 ± 9.44	14.25 ± 10.27
Functional class, %		
1	16.83	20.79
2	70.3	60.4
3	12.87	18.81
DAS28, mean ± SD	4.32 ± 1.31	4.13 ± 1.57
HAQ, mean ± SD	1.22 ± 0.67	1.12 ± 0.69
50-foot walk time, s, mean ± SD	11.19 ± 3.77	11.14 ± 3.37
Leisure physical activity (Baecke score)	16.37 ± 4.62	17.31 ± 7.96

Table 2. Compliance rates for home-based exercise and leisure physical activities for RA patients in the active group (participated in an educational program about exercise) and control group at 6- and 12-month followup.

Group	Compliance Rate N	Active	N	Control	p
Home-based exercise					
6 months, n (%)	89	12 (13.5)	91	1 (1.1)	0.002
12 months, n (%)	89	7 (7.9)	89	3 (3.4)	0.190
Leisure physical activity					
6 months, n (%)	85	24 (28.2)	87	12 (13.8)	0.020
12 months, n (%)	87	8 (9.2)	85	7 (7.1)	0.610

N: number of assessed participants.

Table 3. Baseline clinical status, functional status, psychological status, leisure behaviors and quality of life of patients compliant or not with leisure physical activity program. For most determinants, a dichotomic definition was used, with median as cutoff.

Feature	Compliant Group, n = 36 (%)	Noncompliant Group, n = 136 (%)	p
Active group	24 (66.7)	61 (44.8)	0.02
Living alone	11 (30.6)	57 (42.2)	0.20
DAS28 < 4.2	17 (53.1)	61 (51.7)	0.85
Functional class = 1	4 (11.1)	31 (23.7)	0.10
HAQ < 1.2	20 (55.6)	69 (50.7)	0.61
50-foot walk time < 10 s	12 (34.3)	48 (35.8)	0.87
Leisure physical activity < 16 (Baecke questionnaire)	28 (77.8)	49 (36.3)	< 0.0001
Anxiety (HADS) < 6	15 (41.7)	64 (47.1)	0.56
Depression (HADS) < 10	16 (44.4)	72 (52.9)	0.36
Coping (AHI) < 18	14 (38.9)	67 (49.3)	0.27
Fatigue (FACIT-F) < 18	14 (38.9)	69 (50.7)	0.21
AIMS physical < 22	13 (36.1)	71 (52.2)	0.09
AIMS psychological < 8	12 (34.3)	73 (53.7)	0.04

Differences were examined by use of the chi-square or Mann-Whitney U test when appropriate.

Table 4. Effect of compliance with leisure physical activity program on clinical outcomes of patients with RA at 6-month followup.

Measure	Compliant Group, n = 36 Mean	SD	Noncompliant Group, n = 136 Mean	SD	p
DAS28	–0.38	1.41	–0.48	1.44	0.75
HAQ	–0.14	0.45	–0.08	0.43	0.47
50-foot walk time, s	1.06	4.17	0.24	4.45	0.34
Anxiety (HAD)	–0.42	1.90	0.10	2.43	0.24
Depression (HAD)	–1.19	4.01	0.10	2.71	0.07
Coping (AHI)	–1.25	4.21	0.10	4.09	0.08
Fatigue (FACIT)	–2.94	8.04	–0.10	7.25	0.04
AIMS physical	–0.89	5.13	–0.04	5.15	0.38
AIMS psychological	–1.25	3.12	0.11	3.39	0.03
AIMS social	–0.47	2.14	–0.35	2.32	0.77

8.04 vs –0.1 ± 7.25 for noncompliant patients, p = 0.04, a negative score indicating reduction of fatigue).

DISCUSSION

Patients with RA who were assigned to receive an educational program showed increased compliance with the home-based exercise program and especially with the leisure PA program, particularly those whose baseline leisure PA was poor. Moreover, patients who were leisure PA-compliant showed improved psychological status and decreased fatigue. But these effects were limited and short-term, which is in agreement with results of other studies showing that, in general, patient education has a limited effect on physical and psychosocial health status and health behavior in patients with RA[12,34].

Since our study was a randomized controlled trial, we ensured the internal validity of the study. However, the trial enrolment process before randomization might have resulted in a highly selected population who may not be representative of all people with RA, particularly in terms of age, duration of disease, and level of information about RA[16]. The effect of therapeutic education may diminish in older and well informed patients with long-lasting RA. Therefore this high selection could limit the generalizability of the study results[35].

This multidisciplinary educational program was based on previous programs in other countries[10,11,36] and did not focus exclusively on physical exercise. However, the exercise behaviors after such interventions are usually documented briefly, and our study provided a more precise analysis of them.

The results concerning home-based exercise indicated a relatively low rate of compliance. Poor compliance with treatment recommendations is found across various health states and treatments[37]. As expected, compliance with home-based exercise was poorer than that found with supervised programs for RA[35]. But unexpectedly, it was also poorer than that with an exercise program of minimal supervision used in Hakkinen's trial of early RA[38]; however, lifestyle habits might be more entrenched in patients with long-lasting RA. The most common deterrent to exercise is usually lack of motivation[33,39], so the effects of exercise disappear soon after patients finish a supervised exercise program.

Leisure PA compliance was better than that with home-based exercise. The level of leisure activity was significantly increased at 6-month followup in the active group, but was considered stable in the control group. These results confirm that patients tended to adopt appropriate leisure physical behaviors more easily than they would regularly practice home-based exercises[33]. Home-based training is less time-consuming and can be fit to any lifestyle, but it is certainly less attractive than self-selected leisure activities, and particularly group activities[34], which allow for social interactions that are thought to play an important role in compliance. At 12-month followup, the Baecke score decreased in both groups, although a recent study found no difference in total energy expenditure for RA patients over 12 months[40].

Data regarding determinants of adherence to longterm exercise programs in RA are sparse and inconsistent[15,35,40]. We did not perform multivariate analysis to identify predisposing factors for compliance with home-based exercise because of the low number of participants who were compliant. However, univariate analysis demonstrated a strong relation between compliance with home-based exercise and participating in the active group. However, many more patients allocated to the active group were leisure PA-compliant at 6-month followup. Usual medical care, including the delivery of information booklets, did not change entrenched habits in most patients. Our educational program was an integral part of patient management by helping patients to assimilate the self-care responsibilities and physical exercises and by enhancing a positive attitude toward the leisure physical activities and self-efficacy, which are determinants of adherence to short-term exercise regimens in patients with RA[41].

The multivariate analysis revealed that a baseline leisure PA as assessed by the Baecke questionnaire predicted compliance with the leisure PA program. Previous exercise habits have yet to be identified as a determinant of home-based exercise compliance in RA[41], but in contrast to Stenström's results, the initially less physically active patients were more compliant. This result could be related to a ceiling effect. A lack of sensitivity to change in physical function in response to an exercise program, especially in high-functioning subjects, has been suggested for the results of other self-reporting questionnaires[42]. This result also suggested that our educational intervention allowed inactive people with arthritis to get moving and to approach an adequate level of activity.

Several authors have reported lower PA levels among patients with RA than among the general population[40]. This leisure PA program, formulated with the expertise of a rehabilitation unit staff, aimed to keep RA patients physically active and to counteract the negative consequences, primarily cardiorespiratory effects, of decreased physical fitness. Significant health benefits can be achieved by moving people from inactive to active status[43], and the ultimate goal of this intervention was to keep patients as physically active as possible for them to develop and maintain cardiorespiratory fitness[44].

The univariate analysis demonstrated a significant relation between leisure PA compliance and AIMS psychological subscores, so better psychological status was associated with better leisure PA compliance. But this variable was not identified as a predictor in the multivariate analysis. However, besides physical benefits, leisure PA influenced psychological status and decreased fatigue, identified as one of the most problematic aspects of RA[45]. Not exercising enough could trap patients into a downward spiral, whereby inactivity stimulates pain levels and pain results in more inactivity. Thus, empowering RA patients through self-management exercise could disrupt this spiral.

Our intervention, as with other educational interventions[12], resulted in modest, short-term exercise behavior changes. However, the low rate of inclusion among the eligible patients and the excellent attendance rate in the active group suggested that the participants were highly motivated. That most participants had long-lasting RA in our institution, where they would have previously received a great deal of education regarding their condition, could explain why few changes occurred over the followup for both groups. Whatever the behavior change, a modest benefit for a single person translates to large benefits for society in the long term. Maintaining individuals' motivation to exercise over prolonged periods is not easy, but longterm benefits could be achieved with regular incentives. Reinforcement sessions are not effective in encouraging RA patients[36]. Exercise classes are attractive and

beneficial[34], but not cost-effective[9]. Thus, adoption of recommended leisure behaviors in RA is a longterm, cost-effective challenge facing all healthcare workers. Exercise consultations face to face or by telephone, performed in exercise trials, can help patients maintain high PA levels[46], but in usual medical practice, most physicians aware of the health benefits of exercise admit that they rarely address the subject with their patients[47,48]. Moreover, most rheumatologists and physical therapists still recommend conventional RA exercise programs with exercise restrictions[49], and half the patients who receive an exercise prescription are referred to physical therapy[50], with its questionable cost-effectiveness[51].

Our study showed that a multidisciplinary educational intervention, added to usual medical practice, could convince only a minority of patients with RA to be exercise-compliant in the long term, and that patients tended to adopt appropriate leisure physical behaviors more easily than they would regularly practice home-based exercises. Short bouts of self-selected moderate-intensity activity, such as walking, incorporated into the daily routine can provide physical and mental health benefits and decrease the susceptibility for cardiovascular and other comorbid conditions among patients with RA.

Identification of psychological profiles as well as physical health factors could be investigated in patients with RA to help them overcome barriers to exercise. In our study, a previous low level of leisure PA was identified as a determinant of leisure PA compliance. This study suggested that educational interventions fostering appropriate physical activity could improve lifestyle habits particularly in RA patients with a low level of PA, as a consequence of reluctance to exercise and inadequate physical activity.

Longterm exercise compliance rate was low and motivational strategies are needed to convince participants to undergo longterm physical training. Tailored advice and regular incentives from all healthcare professionals could be a first step toward improving longterm RA patients' awareness of exercise benefits besides pharmacological therapy. This requires convincing both healthcare professionals and patients to become engaged in exercise therapy.

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