

# Importance of patient education in management of patients with rheumatoid arthritis: an intervention study

Soha H. Senara<sup>a</sup>, Wafaa Y. Abdel Wahed<sup>b</sup>, Shima E. Mabrouk<sup>b</sup>

Departments of <sup>a</sup>Rheumatology and Rehabilitation, <sup>b</sup>Public Health and Community Medicine, Faculty of Medicine, Fayoum University, Fayoum, Egypt

Correspondence to Soha H. Senara, MD and Lecturer, Department of Rheumatology and Rehabilitation, Faculty of Medicine, Fayoum University, Fayoum, Egypt.  
Tel: +20 120 155 3117; fax: +20 846 360 583; e-mail: senara.soha@yahoo.com

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## Background

People living with chronic diseases such as rheumatoid arthritis (RA) are extremely in need of patient education (PE) to adapt and cope with the effects of the disease and treatments. PE comprises all educational activities provided for patients, including aspects of therapeutic education, health education, and health promotion.

## Objective

The aim of this study was to evaluate the effect of PE program following the eight evidence-based EULAR-2015 recommendations in the management of patients with RA.

## Patients and methods

A randomized controlled clinical trial with two parallel arms was carried out at the Department of Rheumatology and Rehabilitation, Faculty of Medicine, Fayoum University, Egypt. One hundred patients (both sexes) having RA were included in the study, and their mean age was 39.23±11.28 years, with range from 19 to 71 years. Patients were randomly allocated into two comparable groups: group I received health education through designed PE program and group II did not receive PE program. Disease activity and disability were assessed at the start of study and at two visits later, that is, after 3 months and 6 months, by using the 28 joint disease activity score 28 and the Health Assessment Questionnaire disability index.

## Results

On comparing laboratory investigation and outcome scores at follow-up visits, although there were no significant differences between the two study groups regarding laboratory investigation, disease activity score 28 and Health Assessment Questionnaire scores at the start of the study, comparative differences were reported in the follow-up visits. Significant decreases in the laboratory values and scores were reported in group I, whereas no difference was reported in group II.

## Conclusion

PE interventions in patients with RA documented significant improvements in behavior, pain, and disability among these patients.

## Keywords:

disease activity, patient education, rheumatoid arthritis

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## Introduction

Rheumatoid arthritis (RA) is a common systemic inflammatory disease characterized by the presence of destructive polyarthritis with a predisposition for affecting the small joints of the hand and feet [1]. RA causes progressive functional deterioration leading to disability and impaired quality of life (QoL) [2]. Individuals with RA show psychological distress more than others [3]. In addition, more than 80% of persons having RA have clinically important fatigue [4]. Pain, the main symptom of RA, affects up to 84% of individuals [5], and negatively affects multiple aspects of life [6]. RA occurs owing to an immune response, in which the body's immune system attacks its own healthy cells. The cause of RA is not clear, but it may be owing to genetic and environmental factors. The diagnosis depends mainly on the symptoms and

signs. Radiographs and laboratory investigations may confirm the diagnosis or exclude other diseases with similar symptoms, such as systemic psoriatic arthritis, lupus erythematosus, and fibromyalgia. In 2015, RA affected ~24.5 million people [7,8]. This is between 0.5 and 1% of the adults in the developed countries, with 5–50 per 100 000 people newly developing the condition each year [9]. Onset of RA is mainly during the middle age and affects women 2.5 times more than men [10]. In 2013, it resulted in 38 000 deaths, up from 28 000 deaths in 1990 [11].

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Patients with RA report reduced QoL in several domains, such as physical health, level of independence, environment, and personal beliefs, compared with the healthy population. QoL in RA is affected by fatigue, pain, stiffness, and impaired physical functioning.

In addition, QoL is also influenced by socioeconomic factors such as age, employment, economic status, and lifestyle habits [12]. Health education is a planned learning experience that affects awareness of the patient about his/her illness aiming to change or modify health habits/conduct to be able to collaborate in their therapy [13].

Patient education (PE) for people living with chronic diseases such as RA is extremely important, as this enables them to adapt and cope with the effects of the disease and treatments [14].

PE is highly recommended in RA to support disease management. Guidelines for RA management state that 'education for patients with RA should be provided since first medical encounter' [14] or recommend information to patients in the overarching principle 'treatment of RA patients must be based on a decision between the patient and the rheumatologist. Shared decision-making process requires the need to inform the patient of the risks of RA and the benefits of reaching the optimal disease activity states, and also the pros and cons of respective therapies through two-way communication on the therapeutic target and management plan as well as support for the patient to develop personal preferences' [16].

## Patients and methods

### Study design and setting

A comparative study with randomized parallel two arms, with ratio of 1 : 1, conducted on 100 patients with RA was carried out at the Department of Rheumatology and Rehabilitation, Faculty of Medicine, Fayoum University. Study participants included 100 patients (both sexes) having RA, and their ages ranged from 19 to 71 years, with mean±SD of 39.23±11.28 years. Patients were recruited for the study from May 2016 to February 2017 (about 10 months) and checked for eligibility by the clinical investigator. Exclusion criteria: Patients were excluded if they had evidence of mental disorder or psychiatric diseases. Patients could leave the study at any time for any reason. Patients who met the eligibility criteria were randomly allocated to be divided to two

main groups: group I received health education through a designed health education program, and group II was not acquainted with the health education program.

### Outcome measures

Outcome measures included assessment of disease activity by the 28 joint disease activity score (DAS28) [17]. DAS28 includes 10 PIPs, 10 MCPs, both wrists, both elbows, both shoulders, and both knees; the formula for DAS28 (formula with four variants) calculation was as follows= $[0.56 \sqrt{(\text{TEN28})} + 0.28 \sqrt{(\text{SW28})} + 0.70 \text{Ln}(\text{ESR}) + 0.014 (\text{GH})]$  [where mild<3.2, moderate=3.2–5.1, and severe>5.1. Key: 28 joint count for tenderness (TEN28), SW28, natural logarithm of Westergren's erythrocyte sedimentation rate (ESR) and general health (GH) or patient's global assessment of disease activity on a visual analogue scale of 100 mm].

Assessment of disability was done by using the Health Assessment Questionnaire (HAQ) disability index. The Arabic version of disability index of the Stanford Health Assessment Questionnaire was used to assess disability [18]. Patients were assessed before the commencement of the program (preintervention), 1 week after the 6 week program (postintervention), with follow-up periods at 6 and 12 months.

### Interventions

A PE program designed by authors addressed EULAR 2015 recommendation of PE according to each patient information, which was collected from patients and tailored for each patient according to the age, disease duration, culture, and disease activity [19]. Two overarching principles in any PE program are as follows: PE, which is a planned interactive learning process, should be designed to support and enable people to manage their life with inflammatory arthritis and optimize their health and well-being, and there should be communication and shared decision-making between people with inflammatory arthritis and their healthcare professionals. Both are essential for effective PE.

The designed PE program was offered to recruited patients being managed in a Rheumatology Outpatient Department of Fayoum University Hospital in a community setting. Groups of 8–15 participants randomized to intervention arm attended one session each week for 6 consecutive weeks, with 1 h in duration for each session and then one session every 2 weeks until the second assessment visit (visit II) and then every month until the third assessment visit (visit III).

Modules are inter-related, and cumulative building on previously learned information was ensured. The program was delivered by the authors. The program content individualized for each patient concentrated on the main disease-specific education topics, which were background about the disease nature and medication information, explaining of its onset, mechanism of action, and its duration of administration. Moreover, adverse effects (all patients received one or more of these medications: glucocorticoids, NSAIDs, and DMARDs, such as methotrexate, leflunomides and hydrochloroquine), explaining importance of exercise to maintain posture, balance, and falls prevention, nutrition, psychological support and reassurance and pain management (using pain controlling modalities such as using transcutaneous electrical nerve stimulation). Patients were asked to incorporate what they had learnt, and at each session, a discussion session was conducted with them about their experience about effect of the disease and treatment into their activities of daily living.

#### Statistical analysis

Data were analyzed using the statistical package for the social sciences (SPSS) version 16 (SPSS Inc., Chicago, IL, United States of America). Descriptive statistics were used to describe variables, where number and percent were used for qualitative variables, and mean, SD, and range for quantitative variables. Paired *t*-test was utilized to analyze the variations among values obtained at baseline and follow-up visits. Comparison between groups was done using the  $\chi^2$ -test for qualitative variables. Comparison of quantitative variable was done using independent *t*-test for normally distributed variables and Mann–Whitney test for not normally distributed variables. *P* value less than 0.05 was considered statistically significant.

## Results

Table 1 shows that the two study groups were comparable regarding age (mean group I age=40.42 ±11.7 years and group II=37.9±10.9 years), with *P* value 0.073; moreover, they were also comparable regarding sex, residence, occupation, and education characteristics (*P*>0.05). Duration of disease was significantly longer in group I in comparison with group II; this may be because of the absolute randomness in the selection of patients in both groups.

Study groups were assessed at the first visit and follow-up visits by performing the following tests and measuring scores: ESR, C-reactive protein, rheumatoid factor, DAS28 scores, and HAQ score.

Table 2 showed that the two study groups were comparable regarding basal laboratory investigations,

**Table 1 Comparable demographic characteristics of the cases and control groups except for disease duration**

	Group I (N=50) [n (%)]	Group II (N=50) [n (%)]	<i>P</i> value
Age (years)			
<40	23 (46.0)	32 (64.0)	0.073
≥40	27 (54.0)	18 (36.0)	
Mean±SD (39.23±11.28)	40.42±11.7	37.9±10.9	
Sex			
Male	23 (46.0)	16 (34.0)	0.15
Female	27 (54.0)	34 (68.0)	
Residence			
Urban	14 (28.0)	20 (40.0)	0.21
Rural	36 (72.0)	30 (60.0)	
Occupation			
Working	23 (46.0)	24 (48.0)	0.84
Not working	27 (54.0)	26 (52.0)	
Duration of disease	9.6±5.8	5.8±4.4	<0.001

**Table 2 Comparable comparison between group I and group II at first visit regarding basic laboratory investigations and measuring scores**

Laboratory investigation	Group I (N=50) [n (%)]	Group II (N=50) [n (%)]	<i>P</i> value
ESR			
Positive	50.0 (100.0)	50.0 (100.0)	1
Negative	0 (0.0)	0 (0.0)	
CRP			
Positive	39 (78.0)	45 (90.0)	0.001
Negative	11 (22.0)	5 (50.0)	
RF			
Positive	44 (88.0)	44 (88.0)	1
Negative	6 (12.0)	6 (12.0)	
DAS28 [mean±SD (range)]	4.05±0.69 (3.27–5.2)	4.03±0.55 (3.16–5.2)	0.85
HAQ [mean±SD (range)]	73.38±13.8 (55–92)	68.84±13.42 (50–92)	0.088

CRP, C-reactive protein; DAS28, disease activity score 28; ESR, erythrocyte sedimentation rate; HAQ-DI, Health Assessment Questionnaire-disability index; RF, rheumatoid factor.

and also there was no difference regarding basal DAS28 and HAQ scores.

By comparing laboratory investigation measures and outcome scores at follow-up visits, there were significant differences between the two study groups regarding laboratory investigation such as ESR, C-reactive protein, rheumatoid factor and measuring scores; DAS28; and HAQ scores, with *P* value less than 0.05 (Tables 3 and 4).

Although all 50 (100%) patients of GI continued until the end of the study and all of them improved from moderate to severe disease activity at visit I to mild at visit III, of the 50 patients of group II, only 36 patients were available at second visit, and only 24 patients were available to be assessed at the third visit, with less improvement in their disease activity from moderate to severe at the first visit to mild to moderate at visit III Table 5. In each group, by comparing the mean values of DAS28 and HAQ across follow-up visits, a significant decrease of mean DAS28 and HAQ scores at follow-up visits was seen in both study

groups, but on comparing mean scores at second follow-up visits in comparison with mean score values at start of study, a significant decrease of these scores was recorded in group I ( $P < 0.001$ ), whereas no decrease is reported in group II ( $P > 0.05$ ) (Figs 1 and 2).

## Discussion

RA is a chronic autoimmune disease with a significant effect on the QoL, both physical and mental domains of well-being. In the present study, QoL in patients with RA was studied using the HAQ disability index and the of disease activity by the DAS28.

Education for people living with chronic diseases such as RA is extremely important as this enables them to adapt and cope with the effects of the disease and treatments. While research has identified a whole range of benefits such as improved disease knowledge, self-efficacy, concordance with treatment and physical and psychological health status, it is important to emphasize that PE is heterogeneous in

**Table 3 Significant difference between group I and group II regarding laboratory investigation and measuring scores at the second visit**

Laboratory investigation	Group I (N=50) [n (%)]	Group II (N=36) [n (%)]	<i>P</i> value
ESR			
Positive	29.0 (58.0)	36.0 (100.0)	<b>&lt;0.001</b>
Negative	21 (42.0)	0 (0.0)	
CRP			
Positive	30 (60.0)	31.0 (86.1)	<b>0.009</b>
Negative	20 (40.0)	5 (13.9)	
RF			
Positive	50.0 (100.0)	31.0 (86.1)	<b>0.011</b>
Negative	0 (0.0)	5 (13.9)	
DAS28 [mean±SD (range)]	2.6±0.77 (1.9–3.9)	3.3±0.93 (2.10–4.9)	<b>&lt;0.001</b>
HAQ [mean±SD (range)]	45.0±17.9 (23–86)	55.98±14.67 (33–86)	<b>0.002</b>

CRP, C-reactive protein; DAS28, disease activity score 28; ESR, erythrocyte sedimentation rate; HAQ-DI, Health Assessment Questionnaire-disability index; RF, rheumatoid factor. The bold for significant *P* value (0.001).

**Table 4 Significant difference between group I and group II regarding laboratory investigation and measuring scores at the third visit**

Laboratory investigation	Group I (N=50) [n (%)]	Group II (N=24) [n (%)]	<i>P</i> value
ESR			
Positive	20 (40.0)	23.0 (95.8)	<b>0.00</b>
Negative	30 (60.0)	1 (4.2)	
CRP			
Positive	19.0 (38.0)	19.0 (79.2)	<b>0.001</b>
Negative	31 (62.0)	5 (20.8)	
RF			
Positive	50.0 (100.0)	19 (79.2)	<b>0.003</b>
Negative	0 (0.0)	5 (10.8)	
DAS28 [mean±SD (range)]	1.6±0.4 (1.2–2.3)	3.6±1.5 (1.3–5.1)	<b>0.00</b>
HAQ [mean±SD (range)]	29.0±7.6 (15–75)	59.8±23.13 (23–88)	<b>0.00</b>

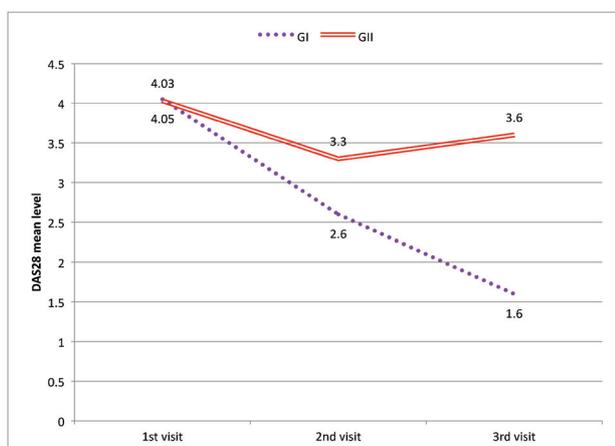
CRP, C-reactive protein; DAS28, disease activity score 28; ESR, erythrocyte sedimentation rate; HAQ-DI, Health Assessment Questionnaire-disability index; RF, rheumatoid factor. The bold for significant *P* value (0.001).

**Table 5 Significant difference regarding disease activity between both groups across visits**

Disease activity according to DAS28	Group I (N=50) [n (%)]	Group II (N=36) [n (%)]	P value
First visit			
Mild	0 (0.0)	8 (16.0)	<b>0.011</b>
Moderate	42 (84.0)	40 (80.0)	
Severe	8 (16.0)	2 (4.0)	
Second visit			
Mild	36 (72.0)	23 (56.1)	<b>0.114</b>
Moderate	14 (28.0)	18 (43.9)	
Third visit			
Mild	50.0 (100.0)	8 (33.3)	<b>0.001</b>
Moderate	0 (0.0)	16 (66.7)	

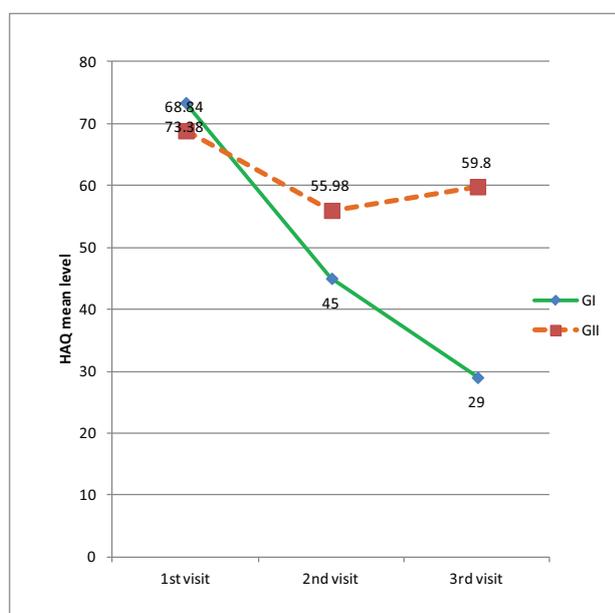
CRP, C-reactive protein; DAS28, disease activity score 28; ESR, erythrocyte sedimentation rate; HAQ-DI, Health Assessment Questionnaire disability index; RF, rheumatoid factor. The bold for significant P value (0.001).

**Figure 1**



Significant decrease of disease activity score (DAS28) in both study groups across visits.

**Figure 2**



Significant decrease of disability assessment scores Health Assessment Questionnaire (HAQ) scores in both study groups across visits.

terms of content, methods of delivery and whether it is group or individual based [15].

The results of this study show that the educational program plus pharmacological therapy significantly improved disability measured by the HAQ, pain intensity, and the number of painful and swollen joints (DAS28). The results of this study show a significant improvement in the laboratory investigations from the first visit to the third visit in the patients in the intervention group. As there were no changes in the drug treatment in the intervention group, this improvement could reasonably be attributed to the effect of the educational program.

These results are similar to those of other authors who found a reduction in disability, pain, and other clinical parameters related to the health status after the application of educational intervention in patients with RA [20]. Lorig *et al.* [21], in a review of 76 articles, found that 61% showed that the educational intervention produced positive changes in the health status. Another study showed a reduction in disability and pain, and an increase in knowledge, joint protection, and the carrying out of exercise after the application of an educational program, which was maintained at 12 months, and suggested that education should be integrated in the treatment of RA [22]. Other reviews found a beneficial short-term effect of educational programs for adult patients with RA [23,24].

However, Abourazzak *et al.* [25] showed that the disease activity was significantly lower in the education group than at baseline (DAS28,  $P < 0.005$ ), but the HAQ scores did not change significantly after the educational program compared with baseline.

In this study, all the patient in the educational group continued to the last visit, but only about half of the patient

in group II continued to the last visit. This may be owing to the increase in awareness of the nature of their chronic illness, the importance of continuing to follow-up with their specialist doctor, the sense of the importance of shared decision making, and the effect of follow-up on disease control and improvement in the QoL.

In summary, this study shows that patients with RA who received both pharmacological treatment and therapeutic education showed significantly greater benefits in terms of health results than those receiving only pharmacological treatment. This suggests that patient-directed education programs should be integrated into the treatment of patients with RA.

## Conclusion

PE interventions in patients with RA documented significant improvements in behavior, drug compliance, pain, and disability scores of these patients.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

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