Prescription for Education: Development, Evaluation, and Implementation of a Successful Interprofessional Education Program for Adults with Inflammatory Arthritis

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ABSTRACT. ***Objective.*** To assess the feasibility of recruitment and standardize care delivery for an interprofessional program for inflammatory arthritis education (Prescription for Education, or RxEd), and to explore outcomes relevant to arthritis patient education.

Methods. A patient-based needs assessment and ongoing patient feedback guided program development. An interprofessional team was involved in developing program content and delivering and adapting the program to patient needs. A quasiexperimental, waitlisted control with crossover design was used to evaluate the program. Data were collected at baseline, immediately following intervention, at 6 months (when the crossover control group received intervention), and at 1 year. Self-report measures included demographics, disorder-related data, Arthritis Self-efficacy Scale, arthritis knowledge, coping efficacy, and illness intrusiveness. Analysis included baseline comparisons and longitudinal trends; direct between-group comparison at 6 months; and generalized estimating equations (GEE) analysis to evaluate the main effect of the intervention on the primary outcome (arthritis self-efficacy) and secondary outcomes.

Results. Program modifications based on patient input made recruitment possible. Forty-two persons participated (including 19 controls), with 93% followup at 1 year. Comparison of change shows moderate effect sizes (standardized effect size 0.5 to 0.7). GEE analysis showed significant main effect, before to after the program, in both groups for primary outcome (arthritis self-efficacy) and most secondary outcomes.

Conclusion. Program feasibility was dependent on patient feedback. Our pilot study provides evidence that the RxEd program is feasible and improves arthritis self-efficacy and other outcomes. (J Rheumatol First Release July 15 2011; doi:10.3899/jrheum.101307)

Key Indexing Terms:
RHEUMATOID ARTHRITIS
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Inflammatory arthritis is a chronic disease characterized by joint pain and stiffness that can lead to joint destruction. Patient education is an important component of arthritis care and complements medical treatment by helping people learn to effectively self-manage their disease.

A Cochrane systematic review of patient education for adults with rheumatoid arthritis (RA) revealed 31 studies[1]. Small short-term beneficial effects were found for scores related to disability, joint counts, patient global assessment, psychological status, and depression. Researchers noted no significant effects for scores on anxiety, pain, and disease activity. Nor did they find evidence of longterm benefit for

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any of the outcomes assessed. However, the results of this systematic review should be interpreted with some caution, largely because of the limited set of outcomes analyzed[1]. The outcomes selected may not be the most relevant in the evaluation of educational interventions. For example, measurement of outcomes such as self-efficacy, knowledge, coping, and the effect arthritis has on patients' lives could be more relevant in assessing the benefits of patient education.

Other observational studies have shown that effective self-management of arthritis through education can reduce pain, decrease physician visits, and improve knowledge and behaviors related to arthritis[2,3].

Self-management education is a problem-based approach that encourages patients to take responsibility for the management of their disease[4]. To be relevant and effective, such educational strategies must focus on actual concerns and problems identified by people with inflammatory arthritis. To that end, we conducted a needs assessment using a convenience sample of people with arthritis[5]. The needs assessment generated a body of patient-based information, which was used to develop an interprofessional education program aimed at helping people with inflammatory arthritis to manage their condition more effectively.

The purpose of our study was to evaluate an interprofessional program for inflammatory arthritis education called "Prescription for Education" (RxEd) for arthritis self-efficacy and other secondary outcomes. This pilot study was developed (1) to assess the feasibility of recruitment for the RxEd program; (2) to standardize care delivery of the RxEd program; and (3) to explore outcomes relevant to education for patients with arthritis and appropriate analytic approaches for the crossover design.

MATERIALS AND METHODS

RxEd program development. A patient-based needs assessment and ongoing patient feedback prior to recruitment guided the program development in terms of format, duration, content, and delivery. The program content was developed with the support and input of the interprofessional arthritis care team, a patient with arthritis, and the clinical researchers who conducted the needs assessment. The patients' needs were incorporated into program development by way of the needs assessment and ongoing feedback during recruitment.

Participant selection. Patients were recruited from arthritis care clinics at an urban teaching hospital. Patients were eligible for inclusion if they were 18 years of age or older and had been diagnosed with 1 or more of the following inflammatory arthritic disorders: RA, psoriatic arthritis, systemic lupus erythematosus, inflammatory bowel disease-related arthritis, or gout. Excluded from the study were those who were unable to complete the questionnaires in English, or had attended an Arthritis Self-management Program (ASMP) in the previous 6 months.

The initial plan for recruitment involved posting signs in the arthritis care clinics both to introduce patients to the study and to remind the interprofessional arthritis care team members to screen for potential participants. The interprofessional team screened patients in their clinics and informed eligible patients about the study (including a brief description of the program), obtained verbal consent for the patient to be approached by the research coordinator, and gave the patient a study package (which included a letter of introduction and the consent form). One week later, the research coordinator contacted the potential participant by telephone to address any questions or concerns about the study. Informed written consent was obtained from all participants. Ethical approval was obtained from the St. Michael's Hospital Research Ethics Board. Patients who refused to participate in the study received usual care, which involved one-to-one treatment and/or counseling by the patient's treating clinician.

The *a priori* criterion for assessing the feasibility of recruitment was in the total number of individuals enrolled in the 2 RxEd sessions that would take place in the course of 1 year, which would be about 24 people in total (or 12 per session).

A quasiexperimental design with waitlisted control crossover was used to evaluate the RxEd program (Figure 1). Self-report questionnaires served as the data collection tool. The baseline questionnaire (T1) was completed by all participants following consent to participate. Followup questionnaires were completed immediately after the first RxEd session (T2), at 6 months (T3), immediately after the second RxEd session (T4), and at 1 year following the beginning of the study (T5; Figure 1). The T2 and T4 followups included a shortened version of the questionnaire, with only the arthritis self-efficacy and knowledge outcomes. We did not expect the coping efficacy and illness intrusiveness outcomes to change immediately following the 1-day education session and therefore chose to exclude them from these timepoints.

Experimental maneuver of intervention group (I). An interprofessional arthritis care team (including a rheumatologist, physiotherapist, occupational therapist, nurse, chaplain, pharmacist, and dietitian) developed the education program. The content of the program was designed to focus on helping participants better understand their disease and manage the pain and difficulties it brought on. The 1-day session included a variety of short presentations and panel discussions by the team, followed by facilitator-led discussions in small groups. The Appendix outlines the program.

Control group (C). This group received usual care and was assigned to a delayed intervention. Usual care referred to informal education and advice offered through regular contact with health professionals. The control group crossed over and received the RxEd program 6 months after the intervention group.

Primary outcome. Self-efficacy, the program's primary outcome, is the degree of confidence one has in the ability to effectively manage some part of one's health[6]. The literature on coping styles has suggested that the sense that one has the ability to do something to control symptoms has been associated with improved adherence to health behaviors (i.e., treatment, preventive activities) and adjustment to disorders such as chronic pain[7,8,9,10]. The primary outcome of self-efficacy was selected because it is a mediator of behavior change.

Lorig, *et al* have developed a way to measure self-efficacy with a focus on management of pain, function, and other symptoms (3 scales, 20 items)[10,11]. These scales have demonstrated internal consistency (α = 0.75–0.90), construct validity, and test-retest reliability (r = 0.85–0.90) in patients with arthritis[11]. Lorig, *et al* have created a shortened version, an 8-item self-efficacy scale, which is less burdensome for subjects than the original scale. The function items have been removed from this scale because there was a high correlation between the self-efficacy function scale and the Health Assessment Questionnaire (HAQ) disability scale. This 8-item measure has been tested on people with arthritis and demonstrated good internal consistency (α = 0.94)[12]. The score for the scale is the mean of the 8 items (range from 1 to 10).

Secondary outcomes. Knowledge about arthritis was assessed using the Arthritis Community Research and Evaluation Unit (ACREU) Rheumatoid Arthritis Knowledge Questionnaire[13]. This 31-item questionnaire has demonstrated acceptable internal consistency (α 0.76), test-retest reliability (r = 0.91), content and construct validity, and sensitivity to change before and after arthritis education[13]. The total score ranges from 0 to 31 (number of correct items).

In addition, we developed a knowledge questionnaire that reflects the content delivered in the RxEd program. The total score ranges from 0 to 34 (number of correct items).

Coping efficacy. Studies have found that people's assessment of their efficacy for coping is related to their coping efforts and well-being[14,15] and to their ability to adapt to musculoskeletal disorders[16]. Gignac, *et al* (2000) have

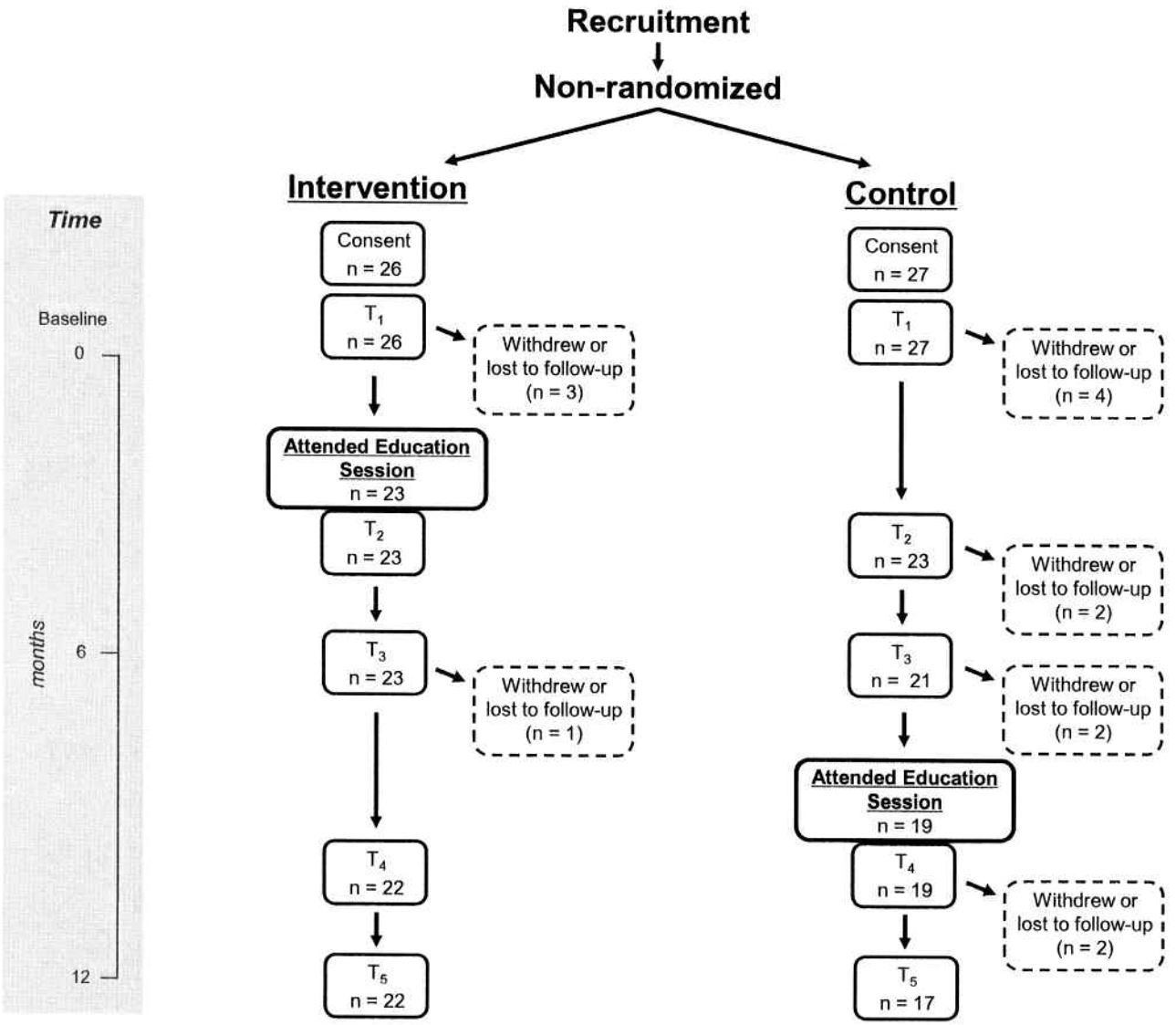

Figure 1. Study design and participation.

developed a 4-item scale measuring respondents' confidence in their current ability to manage or cope with different aspects of their condition[16,17]. This study has reported fair internal consistency (α = 0.79)[17]. The total score ranges from 1 to 10 (greater coping efficacy).

Intrusiveness of illness on life. The 13-item Illness Intrusiveness Scale was used to measure the degree to which an individual's illness and/or its treatment interferes with life domains central to quality of life[18,19,20,21,22]. Construct validity, internal consistency ($\alpha > 0.80$), and test-retest reliability have been reported in people with chronic disease[12,22]. Summed scores range from 13 to 91 (greater intrusiveness).

Patient characteristics. The following patient measures were collected: diagnosis, age, sex, disease duration, marital status, living arrangements, and education level.

Disease activity. The Rapid Assessment of Disease Activity Index (RADAI) is a self-administered questionnaire that combines 5 items into a single index: current and past global disease activity, pain, morning stiffness, and a joint count[23]. The RADAI score is calculated as the mean of the non-missing items and ranges from 0 (no disease activity) to 10 (high level of disease activity). The RADAI is a reliable, valid, and responsive measure of disease activity in persons with RA[23].

Disability. A shortened version (HAQ 8-item Disability Scale) of the HAQ 22-item scale was used as a measure of disability. The HAQ is a reliable, valid, and responsive measure[24]. The score is calculated as a mean of 8 items and ranges from 0 (no disability) to 3 (greater disability). This measure has been tested on subjects with chronic disease with good internal consistency (α = 0.85)[12].

Statistical methods. The data were entered into a database using Access 2002 (Version 10) and then exported into SAS (Version 9.1). Descriptive statistics were used to describe the baseline characteristics of the participants by group (Table 1). Longitudinal plots (I vs C) of mean scores over time (T1 to T5) were created to observe trends for the primary and secondary outcomes.

A direct between-group comparison of the change in self-efficacy at 6 months was used to estimate the effect size. The standardized effect size (SES) between the 2 groups (I vs C) was calculated as the ratio of the treatment effect ($\Delta_I - \Delta_C$) to the pooled standard deviation (PSD) of these differences [i.e., (SES [T3 – T1] = [mean ΔI – C]/PSD)][25]. Dividing the estimated treatment effect by the variability (or noise) of that estimate results in an SES, which enables a direct comparison between competing measures. Similar analyses were repeated for the secondary outcomes as exploratory and hypothesis-generating. Interpretation of the effects sizes was based on the

Table 1. Baseline characteristics of participants by group. Data are reported as frequency (%) for categorical data and mean (SD) for continuous data.

Characteristic	Intervention Group, n = 23	Waitlist Control Group, n = 19	p*
Patient characteristics			
Age, yrs	57.43 (15.31)	51.84 (14.94)	0.25
Women	18 (81.8)	17 (89.5)	0.49
Educational level			0.85
Primary/elementary school or less	0	0	
Secondary school	5 (23.8)	4 (21.1)	
Post-secondary school	13 (61.9)	11 (57.9)	
Unsure	3 (14.3)	4 (21.1)	
Missing data	2	0	
Living arrangements			0.08
Live alone	2 (9.5)	6 (31.6)	
Live with 1 or more	19 (90.5)	13 (68.4)	
Missing data	2	0	
Arthritis type			0.61
RA	18 (78.3)	12 (63.2)	
PsA	1 (4.4)	3 (15.8)	
SLE	3 (13.0)	3 (15.8)	
RA + SLE	1 (4.4)	1 (5.3)	
IBD-related arthritis	0	0	
Gout	0	0	
RADAI score (0 to 10 = greater disease activity)	4.12 (1.69)	3.98 (1.83)	0.8
HAQ 8–item disability score (0 to 3 = greater disability)	0.56 (0.56)	0.45 (0.54)	0.5
Disease duration, yrs	13.15 (11.55)	12.58 (12.93)	0.89
Outcomes			
Arthritis self-efficacy (8-item scale) (1 to 10 = greater self-efficacy)	5.9 (1.75)	6.22 (1.84)	0.58
Previous knowledge (ACREU RA knowledge questionnaire; no. correct items/31)	18.7 (4.37)	20.68 (4.1)	0.14
Content knowledge (RxEd content questionnaire; no. correct items/34)	26.39 (3.53)	27.68 (2.0)	0.14
Coping efficacy (4-item scale; 1 to 10 = greater coping efficacy	3.28 (0.9)	3.8 (0.8)	0.06
Illness intrusiveness (13 to 91 = greater intrusiveness)	50.59 (19.15)	42.01 (18.75)	0.16

* p: differences across groups (chi-square tests for categorical variables and ANOVA for continuous variables). RA: rheumatoid arthritis; PsA: psoriatic arthritis; SLE: systemic lupus erythematosus; IBD: inflammatory bowel disease; RADAI: Rapid Assessment of Disease Activity Index; HAQ: Health Assessment Questionnaire; ACREU: The Arthritis Community Research and Evaluation Unit; RxEd: Prescription for Education program.

most-accepted opinion of Cohen[26], where an effect size of 0.2 is indicative of a small effect, 0.5 a medium, and 0.8 a large.

A pooled analysis, including all subjects and marking data as to whether the observations were made before or after the intervention, was used to evaluate the main effect of the intervention (RxEd) on the primary outcome (arthritis self-efficacy) and secondary outcomes. Using SAS PROC GENMOD statistical procedure, GEE methods were used to create a statistical model for the repeated measures (T1 to T5). The model was set up for a crossover design, estimating differences before and after intervention, while varying the timepoint when intervention was delivered (Figure 2). Group membership was also recorded [intervention (I) and control (C) with delayed intervention].

The interaction between the variables "group" and "prepost" was used to assess for differences in outcome between groups (I vs C). The main effect of the intervention (RxEd) was measured through the variable "prepost."

RESULTS

Feasibility of recruitment. Using the initial recruitment strategy of posting signs in the arthritis care clinics and having the interprofessional team responsible for informing eligible patients about the study, we experienced challenges in identifying potential participants. Only 4 were identified. This was a result of the interprofessional team members being focused on clinical responsibilities and not remembering to screen for eligible patients. This problem was remedied by placing a research coordinator in the clinical areas acting as a reminder to the interprofessional team to screen for potential participants and also making someone immediately available to patients to describe the study and to answer any questions the

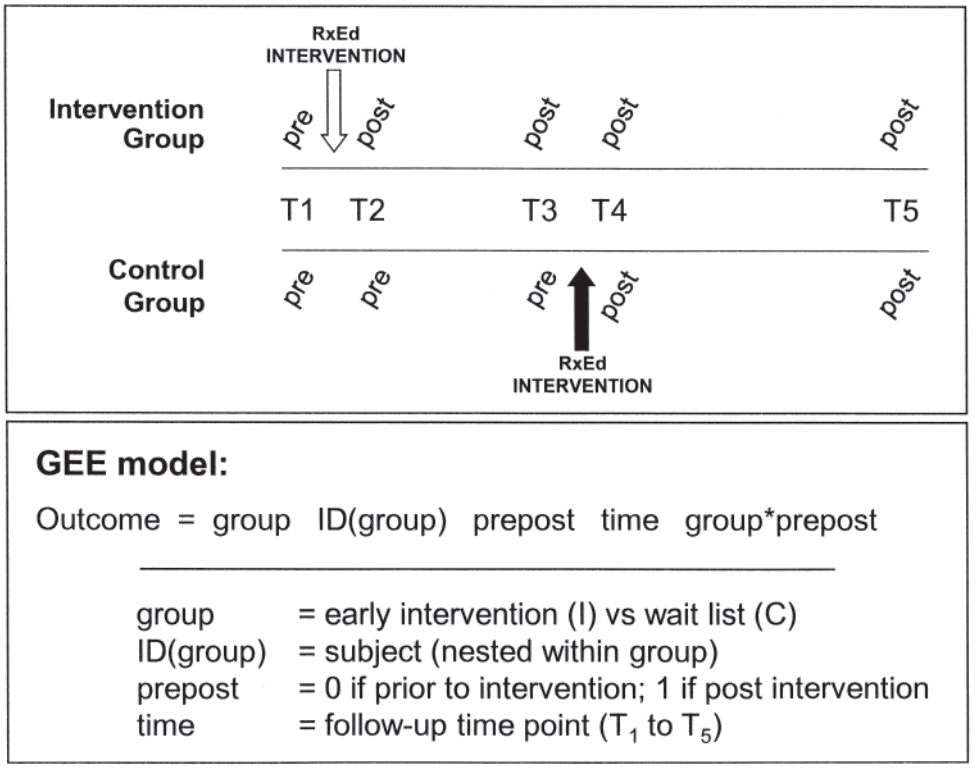

Figure 2. Main effect of intervention. GEE: generalized estimating equations model for repeated measures.

patients had. We also believe that this opportunity to meet the study coordinator in person improved the percentage of followup.

Initially, we experienced further challenges in getting those who were interested in the program to consent to participate in the study. The initial program format included 6 sessions, each 2 h, held once per week in the early evening (4–6 PM) on a weekday. After 6 months of recruiting, we realized that this program format was not feasible because many people being recruited lived outside the city and were unable or unwilling to travel into the city for 6 sessions. Those who were interested were also restricted by work obligations and family commitments that prevented them from attending a 6-week program. This recruitment challenge necessitated the integration of feedback from potential participants and led to the interprofessional team adapting the program format to meet the patients' needs. The intervention delivery was changed to a 1-time intensive program held on a weekend during the day (Table 2). No changes were made to the program content.

The changes in the recruitment process and the program format modifications both contributed to a rapid recruitment of participants. In a 2-month timeframe, we were able to complete informed consent for 53 potential participants. This fulfilled the *a priori* criterion for assessing the feasibility of recruitment.

Standardize care delivery. Our pilot study served well to standardize care delivery of the RxEd program — 2 successful 1-day sessions were held. A program evaluation was completed by participants and anecdotal feedback provided to the study coordinator supports the success of the sessions from the participants' perspectives. Observational notes and facilitator debriefing comments support the consistency of program delivery across the 2 sessions. The interprofessional team facilitated the RxEd content, panel discussions, and case study in the same order, following the same timeline at each session. The content of small and large group discussions differed between sessions. However, the value of these discussions is in the opportunity for participants, as adult learners, to integrate their own experiences with the program content. Of particular value to the participants was the opportunity to spend time with others who also face the daily challenges of inflammatory arthritis.

Table 2. Program format modifications for successful recruitment.

Program Format	Original Design	Modified Successful Design
No. of sessions	6	1
Duration of sessions, hours	2	6
Time of session	Weekday evenings	Weekend day
Total program duration, hours	12	6

Participants. Fifty-three participants completed informed consent and baseline questionnaires. Twenty-six were assigned to the I group (immediate RxEd) and 27 to the waitlisted C group (RxEd 6 months later). Of these, 42 persons participated in the RxEd intervention (I, n = 23; C, n = 19). One-year followup questionnaires were completed by 39 participants (93%; Figure 1).

There were no significant baseline differences between the I and C groups for any of the demographics, disease activity, or disability measures (Table 1). Reasons for withdrawal prior to attending the RxEd program included health problems (n = 4), spouse having health problems (n = 1), on vacation the date of the session (n = 1), working the date of the session (n = 1), and unknown (n = 4). Nonparticipants were similar in age (52.4 years) and most were female (72.4%). Most nonparticipants reported having RA (72.7%) and disease activity (mean RADAI 4.24) and disability (mean HAQ 8-item 0.53) similar to those who participated in the study.

Exploration of baseline outcomes. No significant baseline differences were found for the primary outcome of arthritis self-efficacy or for the secondary outcomes [previous knowledge (ACREU RA), RxEd content knowledge, coping efficacy, and illness intrusiveness; Table 1].

Longitudinal plots of mean scores over time revealed consistency in results across outcomes. For the primary outcome, I group showed immediate effect (improved arthritis self-efficacy) after the intervention and sustained the effect at 1 year. C group showed no effect until crossover (immediate improvement, which diminished over 6 months). Similar findings were observed for each of the secondary outcomes (Figure 3).

For the primary outcome of arthritis self-efficacy, the I group had a mean change (improvement) of 1.06 while the C group had a mean change of –0.04 (slightly worse) at 6 months. The SES was 0.6, demonstrating a moderate effect size when comparing I and C groups. For all the secondary outcomes, moderate effects were found (ranging from 0.5 to 0.7; Table 3).

There was a significant increase in arthritis self-efficacy of 1 unit from before to after the program ($p = 0.04$). The same GEE analysis was performed to determine the main effect of the intervention on each of the secondary outcomes. There was a significant improvement from before to after intervention in the following outcomes: previous knowledge (ACREU RA; $p = 0.002$), coping efficacy ($p = 0.02$), and illness intrusiveness ($p = 0.04$). For the outcome of content knowledge, improvement from before to after intervention was observed, but this improvement was not statistically significant (Table 4).

For arthritis self-efficacy and each of the secondary outcomes, the interaction between the variables "group" and "prepost" (Figure 2) was not significant and therefore we can conclude that the delivery of RxEd changed both groups (early intervention and waitlist control).

DISCUSSION

Our study aimed to do 3 things: to determine the feasibility of carrying out an interprofessional educational program, to standardize the treatment received, and to explore the outcomes and analytic approaches. Program modifications based on patient input made recruitment possible. The program was both feasible and replicable on repeat testing. Patients in the urban setting favored a 1-day intensive workshop over a 6-week program. Patient interest and participant attendance were high.

The outcomes evaluated appeared to have good variability. Most importantly, the effect size estimates were surprisingly strong for a pilot study, in particular a pilot that was subject to contamination bias (clinicians educating the control group) that would have biased our results towards the null. Further, the findings were not only significant for the *a priori* selected primary outcome (arthritis self-efficacy) but also for the related secondary outcomes (previous knowledge, coping efficacy, and illness intrusiveness).

In our pilot study, we have shown that a 1-day inflammatory arthritis education session delivered by an interprofessional arthritis care team was feasible and improved arthritis self-efficacy and other related secondary outcomes in people with arthritis. This was apparent in people with various stages of the disease, with disease duration ranging from newly diagnosed to 48 years.

Several other studies with a concurrent comparison group have used a similar measure of self-efficacy, the Arthritis Self-Efficacy Scale developed by Lorig and colleagues[10,11], to evaluate a patient education program for adults with inflammatory arthritis[27,28,29,30,31,32,33,34,35,36,37,38,39]. Most of these studies evaluated a behavioral-type intervention that included the delivery of information about arthritis and the development of patient skills to manage the disease. Only 1 study evaluated an intervention consisting of information only[28], and the study by Parker, *et al* (1995) included 2 intervention arms (1 behavioral type and 1 information-only type)[35].

Compared to our study, the interventions delivered in these studies tended to be more intensive in both the number of sessions (ranging from 1 to 36, with most 4 to 6 sessions) and the program duration (ranging from 4 to 65 weeks, with most studies 4 to 6 weeks). Of those studies that evaluated short-term outcomes (< 1 year), the results were mixed, with 7 interventions[27,29,30,33,34,35,39] showing positive effects and 7 interventions[28,31,32,35,36,37,38] showing no effect. It is interesting to note that of those studies that evaluated longterm outcomes (1 year or longer), 3 interventions[35,36,39] showed a positive effect and only 1 (an information-only intervention)[35] showed no effect on arthritis self-efficacy.

The RxEd program improved arthritis self-efficacy with a 1-day intervention compared to other more intensive studies that showed mixed effects in the short term. When looking at transitions in outcomes from short-term to longterm, 2 studies showed a sustained improvement[35,39] and 1 study[36] showed a

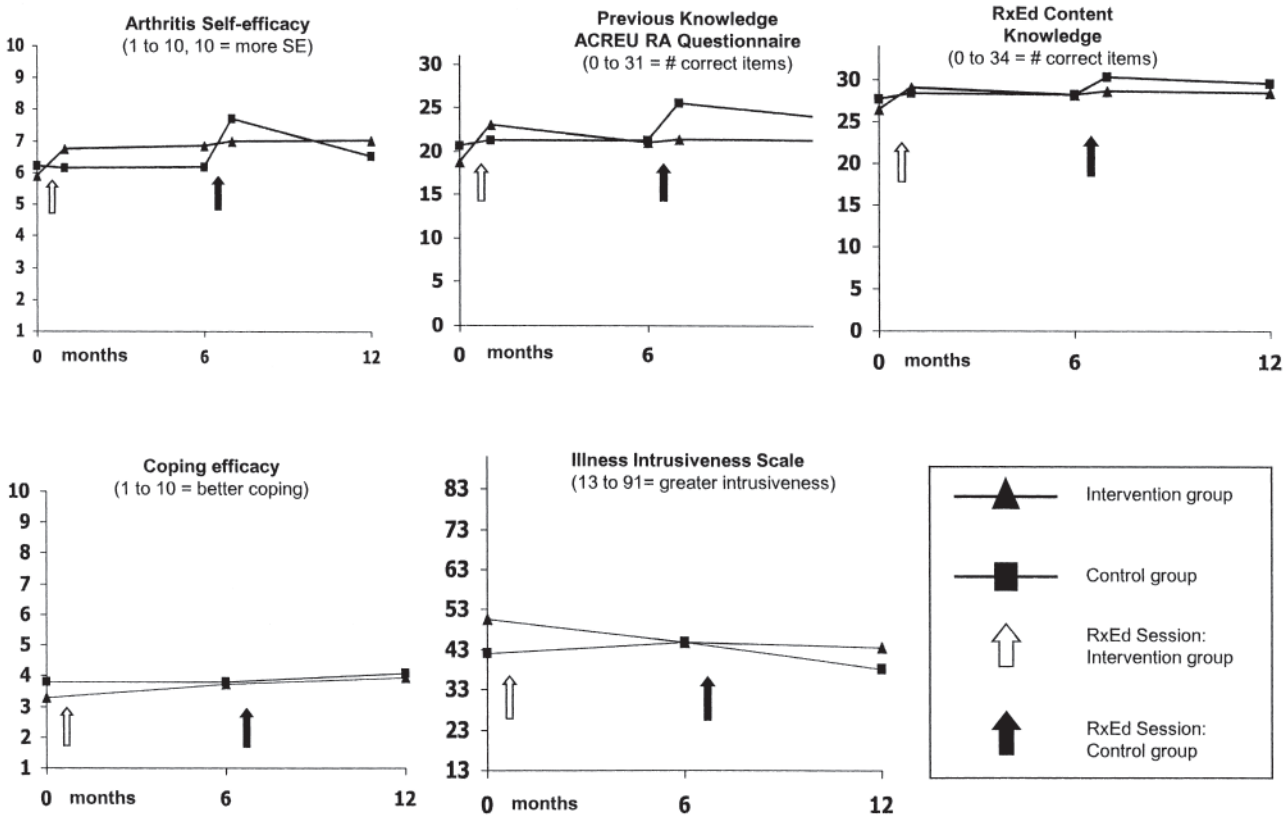

Figure 3. Longitudinal plots of mean scores over time. ACREU: Arthritis Community Research and Evaluation Unit; RA: rheumatoid arthritis; RxEd: Prescription for Education.

Table 3. Analysis of direct between-group comparison (I vs C) of mean change at 6 months and standardized effect size (SES).

Outcome	Mean Change Score (SD) (6 months – baseline)		SES 1 vs C
	Intervention (I)	Waitlist Control (C)	
Primary			
Arthritis self-efficacy	1.06 (1.51)	–0.04 (2.11)	0.6
Secondary			
Previous knowledge (ACREU RA)	2.26 (2.51)	0.58 (3.29)	0.6
RxEd content knowledge	1.74 (2.45)	0.42 (2.93)	0.5
Coping efficacy	0.45 (0.75)	0 (0.64)	0.7
Illness intrusiveness	5.0 (15.46)	–2.93 (9.97)	0.6

Positive change score = better; negative change score = worse; SES = ratio of treatment effect (mean change in I group – mean change in C group) to pooled standard deviation of these differences[25]. ACREU: The Arthritis Community Research and Evaluation Unit; RA: rheumatoid arthritis; RxEd: Prescription for Education program.

transition from no effect to a positive effect in the long term. These findings suggest that there could be continued improvements in arthritis self-efficacy for our participants as they apply the skills learned to effectively manage their arthritis over time.

People with inflammatory arthritis must deal with the disability associated with their chronic condition. They are often limited in their ability to engage in various aspects of their daily lives. Active coping has been shown to have a positive effect on social support and quality of life in people with chronic conditions[40,41], while passive coping in people with arthritis has been shown to have negative effects (on pain, depression, and disability)[42,43]. Thus, many group educational interventions for people with arthritis strive to improve active coping and skills to manage the chronic condition. We have identified 6 studies (including 7 interventions) with con-

Table 4. Main effect of RxEd intervention on primary and secondary outcomes. In all models, interaction between "group" and "prepost" not significant.

Outcome	GEE: Main Effect of Intervention (RxEd)	
	p	Units Improved
Primary		
Arthritis self-efficacy	0.04	1.0
Secondary		
Previous knowledge (ACREU RA)	0.002	2.23
RxEd content knowledge	0.08	1.45
Coping efficacy	0.02	0.48
Illness intrusiveness	0.04	8.0

RxEd: Prescription for Education program; GEE: generalized estimating equations; ACREU: The Arthritis Community Research and Evaluation Unit.

current comparison groups that have included a coping measure to evaluate an inflammatory arthritis education program. Most of the study interventions were of the behavioral type[34,35,44,45,46,47] and 1 was an information-only type[35]. Measures of coping were diverse across these studies (5 different measures were used); they also differed from the coping efficacy measure used in our study.

In comparison with our study, these interventions tended to be more intensive in both the number of sessions (ranging from 5 to 15) and the program duration (ranging from 2 to 65 weeks). Of those studies that evaluated short-term outcomes (< 1 year), the results were mixed. Three interventions[35,44,45] found positive effects and 2 interventions[34,35] found no effect. Of the studies that evaluated longterm outcomes (1 year or greater), 3 interventions[35,46,47] showed positive effects and only 1 intervention (consisting of information only)[35] showed no effect on coping.

Our study and the others described shared, to varying degrees, the aim of changing active coping strategies. These positive effects on coping suggest that interventions that teach self-management skills or coping strategies for dealing with the pain, stress, and fatigue associated with arthritis can result in improved coping.

The goal of many arthritis educational programs is to improve knowledge about the disease and to teach how to manage its chronic nature. We identified 7 studies with concurrent comparison groups that evaluated a measure of knowledge following a patient education intervention for people with inflammatory arthritis. Of those studies that reported short-term outcomes, all reported improvement[28,29,39,48,49,50]. Three studies also included longterm outcomes and reported improvements in knowledge that were maintained at 1 year[39,49,51]. These studies included some interventions that were behavioral[29,39,49,50] and others that consisted of information only[28,48]. The behavioral interventions tended to be more intensive in both the number of sessions (ranging from 4 to 8) and the program duration (ranging from 5 to 8 weeks) while the information-only interventions were less intensive (1 to 2 sessions over 2 to 3 weeks).

The RxEd program shows promise because it has a positive effect on arthritis knowledge with a 1-day intervention compared to other more intensive studies that have a found similar improvement at both the short and the long term. When looking at transitions in outcomes from short to long term, 2 studies showed a sustained positive effect[39,49] at the long term (1 year or greater). These findings suggest that the knowledge about arthritis gained by our participants could be maintained over the longer term.

There are some limitations to our pilot study. First, the organization of the session had to be modified so that we could successfully recruit participants. We had initially planned on running a 6-week (2 h/week) program. However, we were unable to recruit patients because the distance and the time involved prevented them from attending a 6-week program. The session was changed to a 1-day intensive program, limiting the degree to which behavioral change strategies and self-management components (e.g., action planning and goal setting) could be integrated into the education program. We may have seen an even stronger effect on self-efficacy and coping efficacy had we been able to deliver the program over 6 weeks. However, the same content was delivered in the 1-day session as had been planned for the 6-week program. Despite this change in organization, we found positive effects in the primary and secondary outcomes that were consistent with other studies evaluating more intensive arthritis education programs.

There was some potential for contamination bias in our study. Some of the health professionals who delivered the RxEd intervention may have also interacted with the control group as part of their day-to-day clinical practice. Thus, members of the control group may have received some of the information that was delivered in the RxEd program. However, the effect of this would have biased toward the null, thus potentially underestimating the differences between the 2 groups.

Our sample size was relatively small because this was a pilot study and may have reduced statistical power to find significant differences. However, despite the small sample sizes, we found moderate effect sizes (ranging from 0.5 to 0.7) with the direct between-group comparisons at 6 months.

Finally, because participants were a self-selected group of patients willing to participate in the RxEd program, the generalizability of this study is limited to this population.

There are several strengths to our study. First, we used a wide range of outcomes that have been validated in rheumatic conditions and which relate specifically to the purpose of the intervention (e.g., improving self-efficacy and skills for patients to manage their disease). Kirwan, *et al* suggested that a broader set of outcome domains than the traditional "core set" of disease outcomes should be measured in the assessment of educational interventions[52].

Second, a needs assessment generated a body of patient-based information that was used to develop the interprofessional inflammatory arthritis education program. We also included an experienced lay leader (from The Arthritis Society ASMP) who participated in the development of the program.

Third, the crossover design allowed us to look at the effects in both between-group analysis (I vs C) and within the groups over time. We conducted a direct comparison between the groups at 6 months because that is the point at which the control group crossed over and received the RxEd intervention. Despite small sample sizes, we found moderate effect sizes (SES 0.5–0.7) across the primary and secondary outcomes. Given that Burckhardt reports that an effect size of at least 0.3 is considered clinically important for education interventions[53], this further supports the clinical significance of the effects of the RxEd intervention. Additional followup, such as webinars or supplementary educational sessions held by the various interprofessional team members (e.g., targeted to patients requesting more information from a professional group), might lead to larger effects sizes.

Finally, we used a rigorous statistical method, GEE analysis, to evaluate the repeated measures data in a pooled analysis. As a result, even the pilot data from a 1-day interprofessional, inflammatory arthritis education program showed a statistically significant main effect in improving arthritis self-efficacy and other secondary outcomes.

The clinical appeal of an effective 1-day educational program is significant. Results from this pilot study support the feasibility of conducting a larger definitive trial, using more rigorous methods (i.e., randomized controlled design) specifically designed to answer the question regarding the effectiveness of a 1-day interprofessional education program for people with inflammatory arthritis.

Program feasibility was dependent on patient feedback and the associated modifications. This pilot study has shown that a 1-day inflammatory arthritis education session, delivered by an interprofessional arthritis care team, is feasible and improves arthritis self-efficacy and other related outcomes in people with arthritis. Results from this pilot study warrant further evaluation using more rigorous methods. Data from this pilot study will help guide the selection of appropriate outcomes for further evaluation of arthritis education programs.

APPENDIX Outline of the inflammatory arthritis "Prescription for Education" program

Content	Professional Lead	Objective(s)	Format (duration)
Inflammatory Arthritis: The Disease (Anatomy and causes of pain and fatigue)	Rheumatologist	1. Learn the differences between inflammatory and non-inflammatory arthritis. 2. Learn the systematic nature of inflammatory arthritis. 3. Understand how inflammation can lead to joint damage. 4. Learn about types and sources of pain. 5. Learn about fatigue and its sources.	Didactic (30 minutes)
Inflammatory Arthritis: "Medications"	Pharmacist	1. Learn about pain relieving medication. 2. Learn about anti-inflammatory medication. 3. Understand the idea of disease modifying drugs.	Didactic (30 minutes)
Issues related to Disease/Medications	Rheumatologist/Pharmacist	Open for questions/comments and discussion.	Panel discussion (15 minutes)
Arthritis and Exercise	Physiotherapist	1. Learn about the impact of exercise on pain and fatigue. 2. Learn about the purpose of different types of exercises. 3. Understand the difference between activity and exercise and how to set exercise goals.	Didactic (30 minutes)
Arthritis, Food and You	Dietitian	1. Learn about the relationship between food and medication. 2. Develop an understanding of healthy eating and a healthy weight. 3. Dispel myths about arthritis, food and supplements.	Didactic (30 minutes)
Issues related to Exercise/Diet	Physiotherapist/Dietitian	Discuss challenges and possible solutions related to managing diet and exercise on a daily basis. Report to the larger group.	Small group discussion (15 minutes)
Occupational Therapy and inflammatory Arthritis	Occupational Therapist	1. Learn how to balance the energy you have with the tasks you have to accomplish in your daily routine. 2. Learn how arthritis affects self care, work and leisure. 3. Learn ways to decrease and/or avoid pain and fatigue.	Didactic (20 minutes)
Spirituality and Inflammatory Arthritis	Chaplain	1. Understand the difference between religion and spirituality. 2. Explore the concept of wholeness and healing. 3. Identify our spiritual resources.	Didactic (20 minutes)
Case Study	Facilitator-led (members of interprofessional team) small group activity.	Discussing and applying what was learned during the presentations to a realistic case study followed by the sharing of ideas with the larger group.	Small group discussion (20 minutes)

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