Group Education for Rheumatoid Arthritis Patients

Erik Taal, Johannes J. Rasker, and Oene Wiegman

This article reviews the effectiveness of group education programs in improving the knowledge, behavior, and health status of patients with rheumatoid arthritis (RA) and evaluates to what extent various programs fulfill certain criteria for educational self-management programs. Thirty-one studies are reviewed: in 12, patients with various rheumatic diseases including RA were included, and in 19, only RA patients were studied. Group education increased the knowledge of the participants, which was maintained over long intervals. Beneficial behavioral effects were found in mixed populations but less often found in RA patients. Group education often improved physical health status both in mixed and in RA populations, but seldom led to improved psychosocial health status. In general, the beneficial effects of group education were found more often in mixed populations than in strictly RA patients. Further investigations must examine which mechanisms make educational interventions effective and determine the types of interventions or combinations of interventions that are effective. Effects of group education on health status are almost never maintained over long intervals. More research is needed to develop strategies for maintaining and enhancing early gains from group education.
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GROUP METHODS are often used in patient education for rheumatoid arthritis (RA) sufferers. We review studies involving group education for RA patients. Our purposes are to evaluate the effectiveness of the programs in improving knowledge, behavior, and health status and to determine to what extent they meet the standards for educational self-management programs that we have recently proposed (1).

A MODEL OF PATIENT EDUCATION IN RHEUMATIC DISEASES

Patient education can improve the lives of patients with rheumatic disease (2-4). Arthritis patient education has been shown to be effective in improving knowledge and behavior as well as physical and psychosocial health status. An important focus of arthritis patient education is teaching the knowledge and skills necessary to self-manage the consequences of the disease on a day-to-day basis. Adequate self-management is important for RA patients. Treatment for RA is usually a combination of rest, exercises, and medication (5). RA patients must learn to adjust rest, exercise, and medication to the daily, varying phases of disease activity. Patient education can help them adjust their treatment regimens and attain the self-management skills necessary for dealing with the consequences of the disease.

According to the social learning theory of Bandura (6), people's behavior is influenced by their self-efficacy expectations. Self-efficacy expectation refers to beliefs in one's capabilities to successfully execute the behavior required to produce a certain desired outcome. In a previous paper, we described a self-efficacy approach to arthritis pa-

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tient education and discussed methods for influencing self-efficacy expectations and self-management behavior (1). The most effective methods are those based on performance accomplishments and modeling (6). When learning new skills, it is important to break up tasks into smaller, more manageable units, so that self-efficacy may gradually increase. Patients should be provided with feedback concerning their performance. The combination of goal setting in the form of contracts with oneself and feedback has proved to be particularly effective in strengthening self-efficacy and mastering skills (6). Modeling can be implemented in patient education by letting patients who are successful in coping with specific problems act as models. Methods based on performance accomplishments or modeling are particularly suitable for use in group education programs. Patients can provide each other with feedback concerning their accomplishments and can practice newly learned skills together. Modeling can be effectively used by letting group members help each other in solving problems.

CRITERIA FOR EVALUATING EDUCATIONAL SELF-MANAGEMENT PROGRAMS

We have drawn up the following criteria for the development and evaluation of educational self-management programs for arthritis patients (1):

Thorough Problem Analysis

Before developing an educational program, there should be a thorough analysis of the health problems that patients experience as well as the determinants of these problems.

Use of a Theoretical Model

Educational interventions should be based on a theoretical model that clearly indicates the relationships between the methods of influence that are used and the (behavioral) outcomes. We recommend methods based on the self-efficacy approach (1).

Influence Knowledge, Behavior, and Health Status

Patient education should lead to increased knowledge, more effective behavior (eg, coping, problem solving, exercising), and improved health status (eg, pain, disability, depression).

Teach Effective Self-Management Skills

Educational self-management programs should teach adherence to treatment, and the skills for effectively self-managing the consequences of RA. Important skills include those involved in the practice of physical and relaxation exercises, problem solving, decision making, coping with pain and stress, and communication.

Use Effective Methods for Teaching Self-Management Skills and Strengthening Self-Efficacy Appraisals

Often, the only educational method used is persuasive communication. However, transfer of knowledge does not necessarily lead to changes in behavior or self-efficacy. The most effective methods are those based on performance accomplishments and modeling.

Involvement of People From the Patient's Social Environment

Whether patients are able to perform adequate self-management behavior depends in part on the support provided by their spouses or other close relatives. The support given depends on how efficacious it appears. The active participation of family members in education programs can influence their opinions of the patient's capacities positively.

Proper Evaluation of the Program's Effectiveness

The effects of educational programs should be evaluated using experimental and control groups and preintervention and postintervention measurements. Benefits of patient education that are apparent for a few weeks or months often are not maintained in the long term (7). Therefore, reassessment after no less than 6 months is recommended.

METHODS

Studies were selected from among the scientific publications that had appeared in the English, German, or Dutch languages between 1980 and 1995 through a computerized search of the literature using Medline, or were taken from reviews of RA patient education (3, 8-10). Studies that were presented only in abstract or summary form were excluded.

The selection criteria for inclusion were:

1. That a group patient educational intervention be evaluated. Group patient education includes providing information, group discussions, and training in behavioral skills or coping strategies.
2. That a preintervention and at least one postintervention measure be applied.
3. That effects be tested statistically.
4. That the study population consists of patients with rheumatic diseases, including RA.

RESULTS

Seventy-three studies were identified, of which 27 were excluded because they were not concerned with group education. Eleven of the remaining 46 studies were excluded because the study populations did not include RA patients. Finally, four studies were excluded because they only described an education program and did not statistically evaluate the effects. Thirty-one studies met all of the inclusion criteria and were reviewed. Twelve studies included patients with rheumatic diseases other than RA, the percentage of RA patients varying from 11% to 80%. Nineteen reports evaluated educational group programs exclusively for RA patients.

The studies with mixed populations are summarized in Tables 1 and 2. Ten used comparison groups; one included no separate group for comparisons; and one included two substudies (22), one with and one without a control group. Two studies compared groups under lay leadership with groups under health professional leadership (12, 13). Neither showed any major differences between outcomes suggesting that lay leaders can teach such courses effectively. One study (20) evaluated the effects of reinforcement by six weekly group sessions or by four bimonthly newsletters, 8 months after participation in the Arthritis Self-Management Program (ASMP). There was no evidence of enhanced benefits in the reinforced groups. Lindroth et al (17, 18) examined the effects of group education on the mixed population and separately on the RA subpopulation. The effects were comparable in both groups.

The 19 studies that evaluated group education for RA patients are summarized in Tables 3 and 4. Fourteen used control or other comparison groups and five did not.

Effects on Knowledge, Behavior, and Health Status

Changes in knowledge were measured in 16 studies (52%). Most found significant short- or long-term benefits from group education (Table 5).

Changes in behavior were measured in 16 studies (52%). All studies dealing with mixed populations and measuring one or more forms of behavior showed significant short- and long-term benefits (Table 5). In each case, intervention included some type of behavioral training. The behavioral effects of programs for RA patients were disappointing. Unfortunately some (26, 28, 35, 37, 42-44) did not assess changes in all forms of behavior that were taught.

Twenty-seven studies (87%) measured one or more aspects of physical health status. Seventy-eight percent of studies dealing with mixed populations found significant short-term effects (Table 5), and many found long-term benefits. Educational interventions in only RA patients were less effective. Fifty-three percent showed short-term benefits; long-term effects on physical health status were found in only two studies.

Changes in psychosocial health status were assessed in 23 (72%) studies. Mixed populations provided the subjects for seven studies that measured short-term changes and four that measured long-term changes. Beneficial effects were found in three of the former and three of the latter (Table 5). Positive short-term changes in psychosocial health were found for 31% of the interventions among RA patients only (4 of 13). The effects on RA patients were disappointing: only one intervention of seven led to long-term benefits.

Evaluation Using the Criteria

Thorough problem analysis. In most studies, problem analysis consisted of review of the relevant literature. The ASMP (11-13, 19, 21-23), the program of Goeppinger et al (16) and our own (40) were based on needs assessment surveys conducted among patients and health care workers (46-50). The program of Lindroth et al (17) was based on the results of a workshop for health care workers and patients. Three other programs (32, 37, 42) were based on surveys conducted among RA patients (51, 52).

Use of a theoretical model. Many studies (17, 24, 25, 29-32, 38, 41, 42, 45) provide no information about the theoretical model on which their programs were based. Although most showed beneficial effects on knowledge, few showed an effect on behavior (17), physical health status (31, 42), or psychosocial health status (32).

Eight studies (14, 15, 26, 28, 34-37, 39) dealt with cognitive-behavioral programs aimed at pain and stress management and were based on theories of coping with these problems. Only three measured effects on behavior; some changes in the use of coping strategies (34, 37) and the practice of relaxation were found (39). Only 2 of the 8 reports failed to show any effect on pain or physical or psychosocial health status (34, 37). Radojevic et al (39) analyzed relationships between changes in be-

Table 1: Design of Studies of Group Education for Patients With Various Rheumatic Diseases, Including Rheumatoid Arthritis

Study	Intervention	Design/Subjects	Follow-up* (mo)
A. Studies with comparison group			
Lorig et al (11)	6 sessions over 4 months, lay-leaders, lectures, discussion, exercise, skills training, homework	Randomized; n = 190; 11% RA	0 4 16
Cohen et al (12)	a. 6 weekly sessions lay-leaders, same as described in Lorig et al[11] b. 6 weekly sessions professional leaders, lectures + demonstration of exercises/techniques	Randomized; n = 86; 15% RA; 2 experimental groups (a, b), 1 control group (c)	0 2
Lorig et al (13)	6 weekly sessions same as described in Lorig et al[11] a. Lay-leaders; b. professional leaders	Randomized; n = 100; ±15% RA; 2 experimental groups (a, b), 1 control group (c)	2.5
Cziske et al (14)	4 sessions pain-management, homework	Randomized; n = 44; 20% RA	0
Basler and Rehfisch (15)	12 weekly sessions pain-management + homework	Nonrandomized; n = 66; 52% RA	0 4
Goeppinger et al (16)	a. 6 weekly sessions, lay-leaders, lectures, discussion, demonstration of exercise, homework b. Individual home study program	Randomized; n = 374; 16% RA; 2 experimental groups (a, b), 1 control group (c)	0 4 8
Lindroth et al (17, 18)	6 weekly sessions, lecture, skills training	Nonrandomized; n = 195; experimental group 55% RA; control group 80% RA	12 60
Lorig et al (19)	6 weekly sessions, same as described in Lorig et al[11]	Randomized; n = 707; 14% RA	2.5
Lorig and Holman (20)	Reinforcement 8 months after program as described in Lorig et al[11] a. 6 weekly sessions b. 4 bimonthly newsletters	Randomized; n = 543; 19% RA; 260 were offered course a; 70 accepted; 190 did not; 130 received newsletter; 153 controls	10.5
Lorig et al (21)	6 weekly sessions, same as described in Lorig et al[11]	Nonrandomized; 2 groups: a: n = 224; 15% RA, b: n = 177; 24% RA 2 comparison groups: c: n = 523; all RA, d: n = 44; all OA	48
Lorig and Gonzalez (22) A	3 revised forms of program as described in Lorig et al[11] a. Exercise course b. Cognitive pain-management course c. Combined (a + b) course	Randomized; n = 423; 3 experimental groups (a, b, c), 1 control group (d)	2.5
Lorig and Gonzalez (22) B	6 weekly sessions, final revised form of program as described in Lorig et al[11]	One group; no control group; n = 97	2.5
B. Study without comparison group			
Holman et al (23)	6 weekly sessions same as described in Lorig et al[11]	One group; n = 233; 15% RA	48

*Number of months after intervention; 0 months means that effects are assessed directly after intervention.

Table 2: Results of Studies of Group Education for Patients With Various Rheumatic Diseases, Including Rheumatoid Arthritis

Study	Knowledge	Behavior	Health Status			
			Pain	Disability	Other physical*	Psychosocial
A. Studies with comparison group						
Lorig et al (11)	++†	++	++	00	xx	xx
Cohen et al (12)						
a + b *v* c‡	+x	+x	0x	0x	xx	0x
a *v* b	0x	0x	0x	0x	xx	0x
Lorig et al (13)						
a *v* c	0x	+x	0x	0x	xx	xx
b *v* c	+x	+x	0x	0x	xx	xx
a *v* b	−x	+x	0x	0x	xx	xx
Cziske et al (14)	xx	xx	+x	xx	xx	+x
Basler and Rehfisch (15)	xx	xx	++	xx	++	++
Goeppinger et al (16)						
a + b *v* c	+x	+x	+x	0x	xx	0x
Within a	++	++	++	00	xx	++
Within b	++	++	00	00	xx	00
Lindroth et al (17, 18)						
All patients	x+	x+	x+	x0	xx	xx
RA patients only	x+	x+	x+	x+	xx	xx
Lorig et al (19)	+x	+x	+x	0x	xx	0x
Lorig and Holman (20)	xx	xx	x0	x0	xx	x0
Lorig et al (21)						
Within a	xx	xx	x+	x−	xx	x0
Within b	xx	xx	x+	x−	xx	x0
All RA a + b *v* c§	xx	xx	x+	x0	xx	xx
Lorig and Gonzalez (22) A						
a *v* b *v* c	xx	xx	0x	0x	xx	0x
a + b + c *v* d	xx	xx	+x	0x	xx	0x
Lorig and Gonzalez (22) B	xx	xx	+x	+x	xx	+x
B. Study without comparison group						
Holman et al (23)	xx	x+	x+	x−	xx	x+

†0 = no effect found; + = significant positive effect; − = significant negative change; x = not assessed. First sign means effects assessed less than 4 months after intervention, second sign means effects assessed 4 months or longer after intervention.

*Other physical health status includes measures of physical symptoms and sleep problems.

‡See Table 1 for description of groups.

§Only comparison of percentages change between groups without statistical tests.

havior and health outcomes. Among patients who participated with family members in cognitive-behavioral therapy, reduction in skin temperature after relaxation and reduction of passive coping was significantly correlated with decreased joint pain or improved psychological health. Decreases in passive coping with pain also correlated significantly with reduced joint pain among patients who participated in cognitive-behavioral therapy without family involvement. This finding indicates that changes in coping with pain may mediate health outcomes.

Several programs (11-13, 19, 21-23, 33, 40, 44) employed methods based on the self-efficacy approach. Both short- and long-term effects on self-efficacy expectations were often found (21, 22, 23, 33, 40, 44). Changes in behavior were assessed in 7 of 10 studies, and all observed significant effects.

Table 3: Design of Studies of Group Education for Patients With Rheumatoid Arthritis

Study	Intervention	Design/Subjects	Follow-up* (mo)
A. Studies with comparison group			
Kaplan and Kozin (24)	1 educational session (lecture) + 12 weekly discussion-sessions	Randomized; n = 28	0
Potts and Brandt (25)	4 weekly unstructured discussion sessions	Nonrandomized; n = 38	0 6
Shearn and Fireman (26)	a. 10 weekly sessions of stress management b. 10 weekly mutual support sessions	Randomized; n = 81; 2 experimental groups (a, b); 1 control group (c)	0
Bradley et al (27, 28)	a. 5 sessions individual biofeedback + 10 group sessions, lecture, skills training, goal setting, homework b. 15 sessions, lecture, discussion	Randomized; n = 53; 2 experimental groups (a, b); 1 control group (c)	0 6
Furst et al (29) Gerber et al (30)	6 weekly sessions, lecture, skills training, homework	Randomized; n = 28	3
Van Deusen and Harlowe (31)	8 weekly sessions, lecture, discussion, skills training (range of motion dance, relaxation), homework	Randomized; n = 33	0 4
Langer and Birth (32)	4 weekly sessions, lecture, discussion	Nonrandomized; n = 52	0 3
O'Leary et al (33)	5 weekly sessions, cognitive-behavior-therapy	Randomized; n = 30	0 4
Parker et al (34)	a. 1-week inpatient pain-management program b. 1-week inpatient education (lecture, discussion) Both: ±6 support sessions in 1 year	Randomized; n = 83; 2 experimental groups (a, b); 1 control group (c)	6 12
Rehfisch (35)	13 weekly pain-management sessions	Randomized; n = 62	0.5
Huiskes et al (36) Kraaimaat et al (37)	a. 10 weekly sessions behavior therapy + homework b. 10 weekly sessions occupational therapy + homework	Randomized; n = 77; 2 experimental groups (a, b); 1 control group (c)	0 6
Mattussek (38)	8 weekly sessions, lecture, discussion, skills training	Nonrandomized; n = 68	0 3
Radojevic et al (39)	4 weekly sessions: a. Pain-management with family support + homework b. As a without family support c. Education with family support (video, discussion)	Randomized; n = 59; 3 experimental groups (a, b, c), 1 control group (d)	0 2
Taal et al (40)	6 weekly sessions, lecture, discussion, skills training, homework + individual physiotherapy	Randomized; n = 57; control group: only individual physiotherapy	0 2.5 12.5

Table 3: Design of Studies of Group Education for Patients With Rheumatoid Arthritis (Cont'd)

Study	Intervention	Design/Subjects	Follow-up* (mo)
B. Studies without comparison group			
Cartlidge et al (41)	4 inpatient sessions in 2 days, video + discussion	One group; n = 22	0
Berg et al (42)	3 weekly sessions, lecture, discussion, relaxation training	One group; n = 46	1 6
Perlman et al (43)	32 sessions in 16 weeks, dance-based aerobic exercise, discussion, problem-solving	One group; n = 43	0
Davis et al (44)	37 hours' group instruction in 2 weeks, discussion, exercise, skills training + individual physical and occupational therapy	One group; n = 56	0 3
Hammond (45)	2 weekly sessions joint protection education, lecture, discussion, demonstration, practice, homework	One group; n = 10	0.5 1.5

*Number of months after intervention; 0 months means that effects are assessed directly after intervention.
†References 29 and 30 present the same study.
‡References 36 and 37 present the same study.

Of the nine studies that measured them, only two failed to show any significant changes in outcomes for pain or physical or psychosocial health status (12, 13). Lorig et al (19) found very weak associations between changes in behavior and changes in health status among patients who participated in the ASMP. Other studies showed associations between changes in self-efficacy and changes in health status (23, 33), indicating that patient education may work by enhancing feelings of self-efficacy. Lorig and Gonzalez (22) developed three new versions of the ASMP, which emphasized physical exercise, cognitive pain management techniques, or both and incorporated strategies for enhancing self-efficacy. All three produced significantly greater improvements in pain and self-efficacy than were found in the control group, but there were no significant differences in the three intervention groups. Self-efficacy–enhancing education for arthritis patients, therefore, improved health status independently of the forms of behavior that were taught. A new revised ASMP with strong emphasis on the enhancement of self-efficacy was designed on the basis of these findings (22). Participants in this program experienced significant improvements with regard to pain, disability, and depression.

Goeppinger et al (16) showed that changes in pain scores, after participation in self-care education, clearly were influenced by changes in learned helplessness and, to a lesser extent, by changes in self-care behavior.

Influence knowledge, behavior, and health status. Although all programs provided patients with information, only 16 assessed changes in knowledge. Few studies evaluated educational programs not explicitly aimed at influencing behavior (24, 32, 41), but 12 others failed to assess behavioral change (14, 15, 20-22, 26, 28, 35, 38, 42-44). Only four studies (25, 41, 44, 45) did not assess changes in physical or psychosocial health status. Eight studies (26%) measured changes in knowledge, behavior, and health status. One study assessed knowledge and attitudes but not behavioral or health status outcomes (41).

Teach effective self-management skills. The ASMP (11), the revised ASMP (22), and other programs (17, 38, 40, 42, 44) covered a range of self-management skills, including physical and relaxation exercises, problem solving, communication, coping, and joint protection measures. The cognitive-behavioral programs (14, 15, 26, 28, 33-37, 39) concentrated mainly on relaxation exercises and cognitive coping strategies for the management of pain and stress. The programs of Furst et al

Table 4: Results of Studies of Group Education for Patients With Rheumatoid Arthritis

Study	Knowledge	Behavior	Health Status			
			Pain	Disability	Other physical*	Psychosocial
A. Studies with comparison group						
Kaplan and Kozin (24)	+x†	xx	xx	xx	0x	0x
Potts and Brandt (25)	+0	00	xx	xx	xx	xx
Shearn and Fireman (26)						
a + b *v* c‡	xx	xx	0x	0x	+x	0x
Bradley et al (27, 28)§						
a *v* b	xx	xx	+0	xx	+0	00
a *v* c	xx	xx	+0	xx	+0	++
b *v* c	xx	xx	00	xx	−0	+0
Furst et al (29), Gerber et al (30)‖	0x	0x	0x	0x	0x	0x
Van Deusen and Harlowe (31)	xx	0−	xx	xx	++	xx
Langer and Birth (32)	+x	xx	0x	0x	xx	+x
O'Leary et al (33)	xx	0+	+0	00	+0	00
Parker et al (34)						
a *v* c	xx	x+	x0	x0	x0	x0
a *v* b	xx	x+	x0	x0	x0	x0
Rehfisch (35)	xx	xx	+x	+x	+x	+x
Huiskes et al (36)						
Kraaimaat et al (37)						
Overall (anova)	xx	+x	00	00	xx	00
Within a	+x	+x	0−	00	xx	0−
Within b	+x	0x	0−	00	xx	0−
Mattussek (38)	+x	xx	0x	0x	xx	0x
Radojevic et al (39)						
a + b *v* c + d	xx	xx	0x	0x	+x	0x
a *v* b	xx	0x	0x	0x	+x	0x
Within a	xx	+x	xx	xx	xx	xx
Within b	xx	+x	xx	xx	xx	xx
Taal et al (40)	++	++	00	+0	+0	00
B. Studies without comparison group						
Cartlidge et al (41)	+x	xx	xx	xx	xx	xx
Berg et al (42)	++	xx	xx	0+	xx	xx
Perlman et al (43)	xx	xx	+x	+x	+x	+x
Davis et al (44)	+x	xx	xx	xx	xx	xx
Hammond (45)	xx	0x	xx	xx	xx	xx

*Other physical health status includes measures of swollen and tender joints, stiffness, grip strength, walk time, ESR, hemoglobin, thrombocytes, disease activity, fatigue, sleep problems, and range of motion.

†0 = no effect found; + = significant positive effect; − = significant negative change; x = not assessed. First sign means effects assessed less than 4 months after intervention, second sign means effects assessed 4 months or longer after intervention.

‡See Table 3 for description of groups.

§Results summarized in the table are from Bradley et al,[28] Bradley et al[27] given only preliminary outcomes.

‖References 29 and 30 present the same study.

¶References 36 and 37 present the same study.

Table 5: Summary of Beneficial Effects of Group Patient Education*

Variable and Study Population	Studies That Analyze Differences in Change Between Intervention Group and Control Group				Studies That Analyze Changes Within the Intervention Group†			
	Short-term‡		Long-term§		Short-term‡		Long-term§	
	Total No.	No. with Positive Effect	Total No.	No. with Positive Effect	Total No.	No. with Positive Effect	Total No.	No. with Positive Effect
Knowledge								
Mixed population	6	5	1	1	0	0	2	2
Only RA patients	5	4	1	1	6	6	2	1
Behavior								
Mixed population	6	6	1	1	0	0	3	3
Only RA patients	5	2	4	3	6	3	1	0
Physical health								
Mixed population	8	6	4	3	1	1	4	4
Only RA patients	13	7	7	1	2	1	1	1
Psychosocial health								
Mixed population	6	2	1	1	1	1	3	2
Only RA patients	12	3	6	1	1	1	0	0

*Some studies (13, 22, 28, 37, 39) give results for more than one type of group intervention. The numbers in the table refer to the number of interventions, and not to the number of studies.

†When both between-group effects and within-group effects are reported in the study, only the between-group effects are summarized in the table.

‡Short-term effects are measured less than 4 months after the intervention.

§Long-term effects are measured 4 months or longer after the intervention.

(29, 30), Hammond (45), and the occupational therapy group of Huiskes et al (36, 37) were aimed primarily at teaching joint protection measures and energy conservation. The range of motion (ROM) dance program (31) taught participants relaxation exercises as well as ROM dance. The program of Perlman et al (43) concentrated on aerobic exercise and problem solving.

Use effective methods for teaching self-management skills and strengthening self-efficacy appraisals. All of the programs that taught skills used methods based on performance accomplishments: the skills were practiced during the group sessions. Several programs applied other effective methods, such as homework assignments with feedback provided during following sessions (11-16, 19-23, 27-31, 33, 36, 37, 39, 40, 45), sometimes in combination with goal setting or contracting (11-13, 16, 19-25, 27, 28, 33, 40).

Most of the educational group programs included opportunities for discussion among patients, but not all studies explicitly reported the use of modeling as a teaching method. In the ASMP (11) and revised ASMP (22), the lay leaders who conducted the group sessions often had backgrounds and medical problems similar to those of the participants and acted as role models. In the revised ASMP (22) and in our program (40), modeling was incorporated by having patients help each other with solving problems. The ASMP and revised ASMP provided helpbooks that were written with emphasis on modeling (11, 22).

Involvement of people from the patient's social environment. In several programs, family members or close friends were invited to participate in group sessions (11, 16, 19-24, 25, 27, 28, 39, 40, 42), but few studies reported the effects of such participation. Potts and Brandt (25), who evaluated a program of unstructured group discussions, anticipated that patients who were accompanied by family members would show greater improvement in their perceptions of their families' attitudes and behavior than those who were unaccompanied, but the results did not support this view.

Radojevic et al (39) compared a cognitive-behavioral pain management program during which

patients were taught coping skills and family members learned how to assist them in coping with the same program but without family participation. The group with family participation showed significantly greater short-term reduction in number of swollen joints and in severity of joint swelling.

We too found beneficial effects of spouse participation, but our study population was small and spouse participation was not experimentally manipulated (40, 53).

Proper evaluation of program effectiveness. We reviewed only studies using preintervention and postintervention measurements. Seven studies (23%) made no use of a control or other group for comparison (22, 23, 41-45). Potts and Brandt (25) used a control group but analyzed only within-group changes.

Sixteen studies found no benefits 4 or more months after the conclusion of their programs, indicating the importance of measuring long-term effects. Long-term effects on health status often were found in mixed populations, but seldom in RA populations.

CONCLUSIONS

When interpreting our results, one must consider the possibility that bias may have been introduced by the difficulty in getting studies with negative results published. Because of publication bias, the number of studies showing negative effects of arthritis group education may in reality be larger than the number of studies we found.

This review shows that group education was effective in increasing the knowledge of the participants. Programs carried out in mixed populations were effective in changing behavior; group education for RA patients was less so. In approximately 60% of the programs studied, group education led to improvement in physical health status, whether the study populations were mixed or strictly RA. In evaluating effects on physical health status, it must be taken into account that patient education was provided in addition to standard medical care so the effects of patient education are always supplementary to the benefits of standard medical care.

Group education seldom leads to improvement in psychosocial health status. Several studies have shown that most patients see disability, pain, and dependence on others as their main problems, whereas fewer report psychological problems such as depression or anxiety (46, 48, 54, 55).

Studies of mixed populations showed beneficial effects more often than studies of RA patients, suggesting that it is more difficult to influence behavior and health outcomes in RA. Mixed populations often included a minority of RA patients; most participants had osteoarthritis. Lindroth et al (17, 18) showed that the effects of their education program on RA patients were comparable to those in the study population as a whole.

Another factor influencing the results may be sample size. Mixed population studies were much larger than the strictly RA studies. With small sample size, clinically meaningful effects may not be significant (type II error).

To increase the effectiveness of group education for RA patients, the mechanisms that make educational interventions beneficial must be examined, and the types or combinations of interventions that are valuable must be determined. Many of the studies reviewed were not based on a theoretical model indicating the relationships between outcomes and the methods of influence used. Our review shows that programs consisting of only lectures or discussions, that do not include behavioral methods, are ineffective in improving behavior or physical health status. Relationships between changes in behavior and changes in health outcomes are unclear. It appears that changes in health outcomes are not mediated by behavioral changes only, but also by such cognitive factors as self-efficacy.

Another important factor is the influence of people in the patient's social environment. Whether patients' activities are socially impeded or supported depends, in part, on how others perceive them (1, 6). For RA patients, who often are dependent to some extent on spouses, partners, or close relatives for the fulfillment of daily tasks, developing adequate self-management behavior is a process that involves social interaction. The perceptions of the patient's spouse or significant other of the patient's capacities to cope with the consequences of the disease may be an important factor in that process. In many programs, family members or friends participated, but only a few reported on the effects of such participation. The involvement of family members did not enhance

the beneficial effects of the unstructured group discussions of Potts and Brandt (25). In an uncontrolled study, we found some beneficial effects of spousal participation, but our population was small (53). Neither in our study nor in that of Potts and Brandt was spousal participation experimentally manipulated. Radojevic et al (39) did vary family participation experimentally and found that some beneficial effects could be ascribed to family participation. Studies of patient education in other diseases also showed the value of spouse involvement (6, 56).

The effects on physical and psychosocial health status rarely are maintained over long intervals, calling for further research on the development of strategies for preventing relapses and maintaining and enhancing gains. One possibility is the inclusion of booster sessions in educational group programs, held every few months after the intervention. Keefe and Van Horn (7) recommended that two other types of intervention be studied. The first involves teaching patients the skills to prevent relapse, for example, identifying high-risk situations and early warning signs, or behavioral rehearsal methods for coping with setbacks. The second is behavioral spouse training. Further studies are necessary to clarify the effects of spousal involvement in group education for RA patients.

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