Home Exercise in Rheumatoid Arthritis Functional Class II: Goal Setting Versus Pain Attention

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ABSTRACT. ***Objective.*** To evaluate the effects of a 12-week home exercise and cognitive treatment program in functionally independent patients with rheumatoid arthritis.

Methods. Forty-two patients were assessed with the Arthritis Self-efficacy Scale, the Stanford Health Assessment Questionnaire, the Ritchie articular index, measurement of joint mobility, and registration of capacity and pain in functional tasks. The patients were then randomized to either a "goal-setting" subgroup, in which individual goals for the exercise were set and exercise encouraged despite pain, or to a "pain attention" subgroup, where advice to decrease exercise load in case of pain was given. All patients used the same home exercise program aiming at improved range of motion, muscle function and aerobic capacity.

Results. After the intervention period, exercise had conferred better self-efficacy for "other symptoms," increased capacity in most functional tasks, decreased activity induced pain, lowered Ritchie index, and increased joint mobility. Some improvements regarding pain were larger in the goal-setting subgroup.

Conclusion. Home exercise influences self-efficacy for mood and fatigue, physical capacity, and pain. Additional cognitive treatment seems to positively influence the perception of pain. (*J Rheumatol 1994;***21:627–34**)

Key Indexing Terms:
RHEUMATOID ARTHRITIS PHYSICAL THERAPY
COGNITIVE TREATMENT FUNCTION PAIN SELF-EFFICACY

A progressive loss of functional capacity develops early in the course of rheumatoid arthritis (RA) and, despite gradual remission of inflammatory activity, increases over the lifetime of the average patient[1]. There is good agreement that exercise positively influences the physical capacity of patients with RA[2-7], but no subsequent reduction in functional disability has been found[4,7]. Thus factors other than the disease process itself and the patients' physical performance appear to influence functional capacity.

Pain is a major problem in RA. It seems to influence activity levels[8] and functional capacity[8,9] and to have significant relationships with psychosocial factors[8-10]. Such factors are sometimes suggested to be more important than disease related ones[11,12] although there is much confusion about this[13]. It has frequently been reported that exercise seems to influence pain and general wellbeing in patients with RA[2,14,15]. However, its effects on emotions, cognition, or behavior have only occasionally been evaluated in experimental studies[4,6,16].

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Supported by the Sörmland County Council, the Swedish Association Against Rheumatism, the Karolinska Institute, and the Swedish Medical Research Council (MFR B 93-19X-05720-14A).

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Submitted April 20, 1993 revision accepted September 13, 1993.

Uncertainty has been identified as a central concern among patients with RA[17,18]. It is aroused by the unpredictable short and longterm disease course and influences patients' conceptions of their physical and mental capacity[18]. Self-efficacy theory, which deals with judgments of how well one can execute courses of action required to deal with prospective situations and influence thought patterns, actions, and emotional arousals[19,20], offers a useful concept in dealing with uncertainty and perceptions of pain and functional disability. Relationships between pain behavior and self-efficacy in patients with RA have been reported in recent research[21]. Patient education and other forms of cognitive behavioral treatment seem important for enhancing the self-efficacy process in patients with arthritis[22,23], but no exercise interventions with self-efficacy as an outcome measure have been carried out in patients with RA.

Cognitive behavioral treatments, including skills mastery with goal setting, modelling, reinterpretation of physical signs, and persuasion by gentle encouragement and feedback, have been suggested as ways of improving self-efficacy[24]. Physical therapy offers skills mastery in the form of exercise and encouragement. However goal setting may not always be a matter of course, and reinterpretation of physiological symptoms such as pain has so far not been encouraged in patients with RA in whom pain might be an indicator of an active disease process. In patients with chronic pain, however, vigorous exercise regardless of pain complaints has been used successfully to change pain behavior[25-27], and it has been suggested that such exercise

might also be an adequate strategy to modify pain behavior and lead to improved functional capacity in functionally independent patients with RA[28]. No experimental studies have yet been carried out in this area.

Most exercise interventions have been done in clinical settings, while effects of home exercise, which does not link the patient to advanced equipment or specific treatment techniques, and thus makes him or her more independent, have been evaluated seldom.

One aim of our study was to evaluate the effects of an aerobic, dynamic home exercise program on physical capacity, self-efficacy, and the perception of pain and functional disability in functionally independent patients with RA. A further aim was to investigate whether additional cognitive treatment with goal setting and reinterpretation of pain versus recommendations on avoiding overload and increased pain, would influence the exercise results.

MATERIALS AND METHODS

Patients. Forty-eight patients from the Middle Medical District, County of Sörmland, Sweden were recruited either by their doctor or physical therapist at the district hospital or from the rheumatological clinic at the county hospital. The following inclusion criteria were used: RA according to the 1987 revised ARA criteria[29]; age below 70; ARA functional class II[30]; and willingness to participate in the study. The mean age of the patients was 55 (SD 8) years and the mean disease duration 14 (SD 12) years; 70% were women. After baseline investigations, 5 patients were judged unable to perform the exercise program and were excluded from further study. Those excluded had 500 m walking times at self-selected speeds of 10 min or more, while all other exercise group patients had shorter walking times. Another patient did not want to participate in the exercise program because the baseline investigations had caused her increased pain. The remaining 42 patients were randomly assigned either to a "goal-setting" subgroup or to a "pain attention" subgroup (Table 1).

Exercise program. After the baseline investigations, all patients were given personal exercise instructions by a registered physical therapist, and written and taped instructions with accompanying music were given out for home exercises. The same program of exercises for strength and mobility in upper and lower extremities, for stretching, and walking (see Appendix 1) was given to all patients. The exercises were to be performed 5 days a week during the 12-week intervention period. A shoulder pulley apparatus (Sussy RA, Gula Rehab, Kungälv) was used for unloaded shoulder mobility exercises, and a 1.40 m rubber strip (Theraband®, The Hygenic Corporation, Akron, OH) with tied loops at both ends was used for strengthening exercises. According to the manufacturer, the force required to stretch a 310 mm piece of the rubber strip to 510 mm was 1013 g for the thinnest and 3375 g for the thickest of the 5 strips used. After trying different thicknesses, each patient chose a suitable rubber strip. The supervising physical therapist phoned each patient 3 times during the intervention period (after 1, 4, and 8 weeks, respectively). During a subsequent 12-week followup period, there were no special requests or instructions regarding exercise.

Cognitive treatment. In addition to exercise and general encouragement by the supervising physical therapist, cognitive treatment, including goal setting and reinterpretation of activity induced pain, was given to the goal-setting subgroup. An increased load (i.e., thickness of rubber strip) and the timepoint for applying this (after 4 and/or 8 weeks' exercise) was initially decided jointly by the physical therapist and the patient as a goal of the exercise; the patients were also encouraged to increase their walking speed during the intervention period. Patients of this subgroup were not initially told anything particular about pain in connection with exercises. A strategy for the supervising physical therapist's response to the patients' complaints of activity induced pain during the intervention period was decided in advance: The patients should be asked whether the particular joint was swollen. If not, they should be encouraged to go on with the exercise as prescribed; however, in cases of joint swelling, they were to occasionally decrease the exercise load for that particular joint, and possibly rest it for a day or 2.

Table 1. *Demographic, and baseline disease related data on 42 patients with RA who entered the study in the goal-setting subgroup, or pain attention subgroup. There were no significant differences between the 2 groups according to Mann-Whitney or the χ^2 test*

	Goal Setting n = 22 Median (range)	Pain Attention n = 20 Median (range)
Female, %	68	70
Age, years	53.5 (26–68)	58 (43–69)
Disease duration, years	10 (3–46)	7.5 (3–35)
Married, %	82	85
Education, years	7.5 (6–14)	8.5 (7–14)
Occupation, %		
Full	27	25
Part	23	25
No	50	50
Rheumasurgery, %		
No	55	45
Arthroplasty	23	25
Medication*, %		
No	10	15
NSAID	82	80
DMARD	40	45
Oral steroids	18	25

* Many patients combined 2 or 3 types of medication.

The pain attention subgroup was given the same exercises and encouragement by phone as the other exercise subgroup. However, after their initial choice of rubber strip thickness, these patients were told that strips giving greater load would be available on request, but no specific exercise goal was set. They were also instructed personally, in writing, and repeatedly (6 times) on their exercise tapes to be careful about increased pain lasting more than 2 h after exercise, and thus, to not overstrain themselves while exercising. The predetermined strategy for the supervising physical therapist's response to these patients' complaints of activity induced pain during the intervention period included advice to decrease load and, if the pain persisted, to rest for some days.

Investigations. Before and directly after the 12-week intervention period and after the additional 12-week followup period the patients were assessed with the following self-administered questionnaires.

A questionnaire eliciting current information on demographic factors, work status, sick listing, medication, steroid injections, and arthritis related surgery. Every exercise occasion during the intervention period was marked in a diary. In addition, questions on exercise frequency during the previous 12-week period (never, 1–2, 3–4, 5–6 times a week, or every day) were put to all patients after the followup period.

The Arthritis Self-efficacy Scale[23] a self-administered questionnaire containing 20 questions, each followed by a scale (10–100) and combined to the 3 subscales, 'pain management', 'physical function', and 'other arthritis symptoms', was used. The higher the score, the better the self-efficacy. The original Arthritis Self-efficacy Scale and its Swedish version have both shown satisfactory reliability and validity[31,32].

Functional Disability Index of the Stanford Health Assessment Questionnaire (HAQ)[33] was used. The HAQ is self-administered, and performance is measured in activities of daily living on 8 subscales, which are averaged

to create a disability index ranging from 0 (able without difficulty) to 3 (not able). Modified slightly and translated into Swedish, it has been shown to possess high reliability and validity[34].

Before and directly after the intervention, the patients were additionally investigated with the following measures by a physical therapist blinded to patient subgroup.

Ritchie Articular Index[35], which scores joint tenderness on a 4-grade scale (0–3) combined to a maximum possible score of 78 (maximum tenderness). Tenderness is elicited by palpation of the jaw joints and all extremity joints except the hip, talocalcaneal, and midtarsal joints where it is elicited by passive movement; the cervical spine is also assessed by passive movement.

Joint mobility was measured with a goniometer in standardized positions[36]. All movements about the longitudinal, the bilateral, and the dorsoventral motion axes were recorded when applicable in shoulders, elbows, forearms, wrists (not radial and ulnar deviation), hips, knees, and ankles; the values obtained were then summed to give a joint mobility index.

Six functional tasks were performed in a given order: (a) walking 500 m outdoors on level ground at self-selected walking speed, checked with a speedometer cart[37] and replicated at a postintervention test; (b) walking up and down a flight of stairs (20 steps) as fast as possible, time measured with a stop-watch; (c) rising from the lowest stool between 0.30 and 0.50 m that the patient could sit on and rise from without arm help; (d) lifting a basket with maximum possible load (0–15 kg) from a height of 0.50 m to nose level; (e) lifting a basket containing maximum possible load of 0–20 kg from the floor to a height of 0.50 m; (f) walking 500 m outdoors on level ground at maximum speed. In connection with each of the 6 tasks, the patients rated their pain on a visual analog scale (0–100). If capacity in tasks (c)–(e) improved at the postintervention test, the pain ratings were still obtained for the baseline capacity to obtain changes in pain levels for a given load.

Statistics. Data regarding the whole group of exercising patients is presented as mean values with standard deviations in brackets, differences between baseline data and 12 and 24-week data, respectively, were analyzed with the paired t test. Due to the wide variations in results and the limited number of patients, data regarding the subgroups is presented mainly as median values with ranges in brackets. Mann-Whitney's test or the χ^2 test were thus used for the examination of differences between the subgroups at baseline and for changes during the intervention and followup periods. Calculations of effect sizes (final score-initial score/initial standard deviation) were used to examine clinical significance in addition to statistical significance[38]. Effect sizes between 0.20 and 0.50 were considered as small, 0.50–0.70 as moderate, and over 0.70 as large[38].

Ethical scrutiny. The design of the study was approved by the Ethical Research Committee, Örebro Regional Hospital, Sweden.

RESULTS

One patient from the goal setting subgroup refused for unknown reasons to participate in the postintervention examination. Another patient from the same subgroup underwent total knee arthroplasty during the intervention period. They were both subsequently excluded from further study.

Exercise effects. A mean number of exercise occasions/patient of 59 (SD 12.9, range 27–87) times was reported. This was 98% of the requested 5 times/week during the 12-week intervention. Thirty-four of the 40 patients started with the thinnest or the next thinnest rubber strip as exercise load.

Baseline and postintervention results for the whole group are shown in Table 2. Self-efficacy for other symptoms improved significantly ($p \leq 0.05$), but no differences were found on the subscales for pain and function. The HAQ score did not improve. However, significant improvements ($p \leq 0.01$) were found in all functional tasks except maximum walking speed, in all ratings of activity-induced pain, in Ritchie articular index, and in joint mobility of both upper and lower extremities. Large effect sizes[38] were seen on pain intensity ratings at maximum walking speed, at lifting to nose level, and in joint mobility of the lower extremities.

Effects of cognitive treatment. There were no differences between the patients of the goal setting subgroup, and those of the pain attention subgroup regarding baseline investigation data (Tables 3 and 4). Nor did they differ in initial exercise load chosen, or in reported exercise frequencies during the intervention period. However, while 17 patients of the goal-setting subgroup increased exercise loads as a part of their cognitive treatment, only 4 patients of the pain attention subgroup spontaneously did so. This difference between the subgroups was significant ($p \leq 0.001$).

After the intervention, significantly larger decreases of pain rating for lifting to nose level ($p \leq 0.05$), and of Ritchie articular index ($p \leq 0.05$) were found in the goal-setting subgroup than in the pain attention subgroup. No other differences in change scores between the 2 subgroups were found (Tables 3 and 4). There were no significant differences between the subgroups regarding changes of medication or in the receipt of steroid injections during the intervention period: 17 patients in the goal setting subgroup, and 18 in the pain attention subgroup continued to receive unchanged medication; 7 patients in the former group and 6 in the latter received steroid injections.

Followup. During the 12-week followup period, the 40 patients of the exercise group reported that they exercised at mean 3 times a week (SD 2). After the followup period, mean self-efficacy scores were 52 (SD 23) for pain, 64 (SD 25) for function, and 64 (SD 20) for other symptoms, while the mean HAQ score was 0.77 (SD 0.51). These values did not differ significantly from the baseline values shown in Table 2.

No significant differences in self-efficacy or HAQ scores occurred between the two subgroups during the followup period (Table 4).

DISCUSSION

The home exercise program we evaluated positively influenced pain, physical capacity, and joint mobility. Although the aim was to evaluate home exercise as a suitable strategy for the patients with RA, the results also have important implications for the organization of physical therapy services, as cost effective delivery mechanisms are being sought in many countries. However, a physical therapist's evaluation (before and after the home exercise program), instruction, help with setting and modifying goals, encouragement, and accessibility in case of trouble may very well be important for the patients' compliance and for a good out-

Table 2. *Baseline data and data after 12 weeks of exercise for 40 patients with RA who completed the home exercise program*

	Baseline Mean (SD)	12 Weeks Mean (SD)	Significance Level	Effect Size
Self-efficacy				
Pain, 10–100	53 (16.3)	53 (21.3)	NS	0.03
Function, 10–100	63 (16.6)	66 (22.7)	NS	0.18
Other symptoms, 10–100	62 (13.2)	68 (18.5)	*	0.48
HAQ, 0–3	0.75 (0.42)	0.68 (0.51)	NS	0.17
Walking				
Self-selected speed, min	6.8 (1.1)	—	—	—
Pain, 0–100	25 (20.6)	13[b,c] (19.7)	***	0.57
Maximum speed, min	5.8 (0.9)	5.7[b] (1.0)	NS	0.11
Pain, 0–100	39 (24.8)	22[b] (19.8)	***	0.70
Stair-climbing, s	28 (11.8)	25[b] (9.0)	***	0.31
Pain, 0–100	26 (20.7)	16[b] (19.5)	**	0.47
Rising, m	0.34 (0.063)	0.31[a] (0.034)	**	0.48
Pain, 0–100	19 (19.0)	9[c] (13.3)	**	0.52
Lifting, 0.50 m – nose				
Load, kg	6 (4.1)	8[a] (4.5)	***	0.60
Pain, 0–100	43 (18.6)	25[a,c] (25.8)	***	0.97
Lifting, floor – 0.50 m				
Load, kg	15 (5.1)	17 (4.4)	***	0.29
Pain, 0–100	33 (23.9)	19[c] (19.0)	**	0.60
Ritchie's articular index, 0–78	26 (14.7)	19 (13.2)	***	0.42
Joint mobility				
Upper extremities, °	1749 (129.0)	1822 (148.5)	***	0.57
Lower extremities, °	807[a] (53.6)	855 (65.0)	***	0.90

[a] 1 missing value, [b] 2 missing values, [c] at baseline load (see Investigations).
NS = $p > 0.05$, * = $p \leq 0.05$, ** = $p \leq 0.01$, *** = $p \leq 0.001$ (paired t test).
Effect sizes: 0.20–0.50 = small, 0.50 – 0.70 = moderate, more than 0.70 = large (38).

come. When exposing patients with chronic pain to treatment that initially may induce more pain, low compliance could be expected. A 98% compliance with the amount of exercise prescribed in our study, compared to compliance of 39–65% reported in clinical settings[39], might reflect the use of the supervision system applied, but might also be due to other factors, e.g., special motivation among the participating patients or the fact that they were actually participating in a study.

In a study by Ekdahl, *et al*[7] evaluating the effects of a 6-week intervention with daily home exercise in functionally independent patients with RA, no differences were found regarding exercise results between patients with 12 scheduled clinic visits during the period and those with 4. Our findings validate the conclusion of Ekdahl, *et al* that, even with limited clinical access to physical therapy, it is possible for patients with RA to carry out exercise and improve physical capacity.

Self-efficacy regarding other symptoms such as mood and fatigue was low to moderately improved by our exercise intervention. This validates earlier findings of improved sleep[4] and reduced anxiety and depression[6] as results of aerobic exercise in arthritis patients and, furthermore, indicates that the Arthritis Self-efficacy Scale[23] might be a useful outcome measure of the improved well being frequently reported as a result of exercise.

Regarding the effects of the cognitive treatment given, our results show that goal setting was important for the increase of exercise load, as most patients in the goal setting subgroup increased load, while only a few in the pain attention subgroup spontaneously did so, although they knew that thicker rubber strips were available. However, no subsequent difference in physical capacity between the 2 groups was found, which might in part be due to weak statistical power.

Several patients in both exercise subgroups reported during the regular telephone calls made by the supervising physical therapist that they really had to struggle to overcome pain and stiffness while exercising. However patients in the goal setting exercise subgroup seemed to comply well with their instructions aimed at reinterpretation of activity induced pain. It may seem that the patients who participated in the goal setting subgroup were unnecessarily roughly treated with respect to pain, and it may be asked whether such a policy was (1) risky with regard to their rheumatic disease, and (2) necessary. Regarding the risks of exercise in RA, several studies have concluded that exercise does not seem to aggravate arthritis with respect either to disease activity[2,3,6,7,16,40,41] or to radiological progression[3,16,41,42]. Furthermore, indications of increased inflammatory activity, in the form of increased joint tenderness, increased drug intake, or a larger number of steroid injections given, were not found in the goal setting subgroup. Regarding the [illegible]

Table 3. *Baseline data and median 12-week change scores regarding physical capacity and pain for 40 patients with RA who completed the home exercise in either the goal-setting or pain attention exercise subgroups*

	Baseline Investigation Data Goal Setting n = 20 Median (range)	Pain Attention n = 20 Median (range)	Significance Level
Walking			
Self-selected speed, min	6.50 (5.72–9.17)	6.60 (5.57–8.75)	NS
Pain, 0–100	20 (0–76)	23.5 (0–53)	NS
Maximum speed, min	5.50 (4.27–7.42)	5.64 (4.17–7.83)	NS
Pain, 0–100	29.5 (0–70)	48.5 (0–80)	NS
Stair-climbing, s	23 (19–80)	25.5 (18–48)	NS
Pain, 0–100	22.5 (0–73)	32 (0–58)	NS
Rising, m	0.30 (0.30–0.50)	0.30 (0.30–0.50)	NS
Pain, 0–100	8.5 (0–62)	28.5 (0–60)	NS
Lifting, 0.50 m – nose, kg	5.5 (1–15)	4 (0–15)	NS
Pain, 0–100	45 (12–83)	44.5 (5–88)	NS
Lifting, floor – 0.50 m, kg	20 (7–20)	12.5 (7–20)	NS
Pain, 0–100	32.5 (0–75)	32 (0–76)	NS
Ritchie articular index, 0–78	25 (5–20)	21.5 (1–57)	NS
Joint mobility			
Upper extremities, °	1790 (1395–1890)	1770 (1430–1965)	NS
Lower extremities, °	815[a] (735–910)	785 (710–905)	NS
	Change Score Week 12 – Week 0		
Walking			
Self-selected speed, min	—	—	
Pain, 0–100[c]	−19.5 (−73–+14)	−2.5[b] (−42–+32)	NS
Maximum speed, min	−0.17 (−1.05–+0.90)	−0.05[b] (−0.85–+0.67)	NS
Pain, 0–100	−17.5 (−70–+30)	−9.5[b] (−50–+20)	NS
Stair-climbing, s	−3 (−30–+2)	−3[b] (−13–+13)	NS
Pain, 0–100	−15.5 (−73–+27)	−2[b] (−42–+47)	NS
Rising, m	0.00 (−0.10–0)	0.00 (−0.20–0)	NS
Pain, 0–100[c]	−5.5 (−62–+23)	−12 (−45–+65)	NS
Lifting, 0.50 m – nose, kg	2[a] (0–+10)	2 (−4–+8)	NS
Pain, 0–100[c]	−33[a] (−50–+12)	−11 (−52–+50)	*
Lifting, floor – 0.50 m, kg	0 (−2–+8)	0 (0–+7)	NS
Pain, 0–100[c]	−8.5 (−70–+31)	−9 (−55–+27)	NS
Ritchie's articular index, 0–78	−8 (−36–+2)	−1 (−21–+14)	*
Joint mobility			
Upper extremities, °	100 (−65–+255)	55 (−185–+315)	NS
Lower extremities, °	60[a] (−25–+135)	62.5 (−35–+145)	NS

[a] one missing value, [b] two missing values, [c] at baseline load (See investigations). NS = $p > 0.05$, * = $p \leq 0.05$ (Mann-Whitney test).

sity of reinterpretation of pain, it was found after the intervention that the Ritchie articular index and activity induced pain on lifting to nose level were better in the goal setting subgroup than in the pain attention subgroup. These findings indicate that the type of cognitive treatment used in our study might add something to the physical exercise effects through changing the patients' perceptions of pain; also this treatment does not aggravate the disease process.

Neither the home exercise program nor the cognitive treatment showed any influence on self-efficacy regarding pain and function or on HAQ scores. One reason might be that the program evaluated did not influence these factors. Another might be that the opportunities for positive feedback (an important part of self-efficacy enhancement strategy) were not taken, as the patients were not aware of their positive exercise results regarding pain, joint mobility, and physical capacities either at the 12 or 24-week assessments of self-efficacy. Furthermore, the HAQ might be insensitive to changes in a group of functionally independent patients with RA with mean scores below 1.00. Such a score means that the patient carries out activities with some difficulty. Many patients with RA seem to consider this difficulty to be pain,

Table 4. *Baseline scores and median 12-week and 24-week change scores, respectively, regarding questionnaire answers for 40 patients with RA who completed the home exercise in either the goal setting or pain attention exercise subgroups. There were no significant differences between the 2 groups according to Mann-Whitney test*

	Goal Setting n = 20 Median (range)	Pain Attention n = 20 Median (range)
Baseline scores		
Self-efficacy		
Pain, 10–100	56 (28–76)	52 (22–88)
Function, 10–100	68 (41–87)	60.5 (23–98)
Other symptoms, 10–100	62 (43–77)	61 (37–92)
HAQ, 0–3	0.75 (0.13–1.63)	0.75 (0.13–1.88)
Change scores week 12 – week 0		
Self-efficacy		
Pain, 10–100	4 (−56–+38)	4 (−32–+26)
Function, 10–100	9.5 (−18–+54)	5.5 (−40–+27)
Other symptoms, 10–100	8 (−28–+42)	5 (−31–+20)
HAQ, 0–3	−0.13 (−0.5–+0.25)	−0.13 (−0.63–+2.00)
Change scores week 24–week 0		
Self-efficacy		
Pain, 10–100	0 (−52–+52)	4 (−62–+26)
Function, 10–100	0.5 (−27–+40)	−0.1 (−40–+30)
Other symptoms, 10–100	1 (−30–+35)	1.5(−33–+24)
HAQ, 0–3	−0.12 (−0.62–+0.62)	0 (−0.62–+1.5)

and although pain decreases, they still have some difficul in carrying out the activity. A reason why our study faile to demonstrate statistically significant differences betwee the subgroups, might be that it was not conclusive becaus of the relatively small number of patients and a wide varia tion in outcome results. Ours is the first experimental stud evaluating the combined effects of physical exercise and cog nitive treatment in patients with RA with self-efficacy as on of the outcome variables; as such, it may still provide som valuable information.

In conclusion, the home exercise program evaluated here seemed to be efficient, not only in improving physica capacity and decreasing pain, but also in increasing self efficacy regarding some disease consequences in RA. The perception of pain seemed to be positively influenced by the additional cognitive treatment given, but more research is needed regarding its influence on self-efficacy and the perception of functional disability.

ACKNOWLEDGEMENT

Sincere thanks to Aina Nilsson, RPT and Karin Svensson, RPT at the Kullbergska Hospital for their patience and flexibility in patient assessments, to Ulla Bento, RPT at Nyköping Hospital, and Birgit Lönnborg, RPT at the Mälar Hospital, Eskilstuna for help with tracing patients for the study; and to Pia Meijer, RPT for illustrating the exercise program.

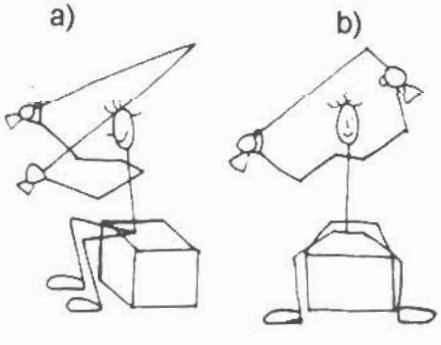
APPENDIX 1

Home exercise program

To the pain attention group only: The exercises must not cause pain. It is important that you respect this, and let the way you feel now determine how much effort you put into the tasks.

1. Stand on the floor in front of a step and:
a) step up on, and down from the step with your right foot first (16 times 'up-up-down-down' in one minute);
b) repeat with your left foot first.

2. Sit on a stool, close to a door where you have put up the shoulder pulley, and with your back turned towards the door. Grasp the handles and pull slowly:
a) forwards – upwards (16 times);
b) outwards – upwards (16 times).



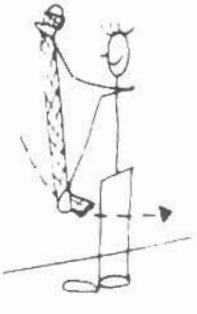
3. Remain seated on the stool and keep grasping the handles of the shoulder pulley. Squeeze the handles with your right and left hands alternately (12 times for each hand).

4. Remain seated on the stool, and:
a) put one loop of the rubberstrip under your foot, and the other around your right hand (all the way into the web of your thumb). Place your right elbow on your right thigh, and bend your right arm against the resistance (hold 2 s, rest 2 s, 8 times). Note that your back is straight, your shoulders lowered and your shoulder blades pulled together;
b) repeat on the opposite side.

5. Stand up. Put the loops of the rubberstrip around your hands as shown in the figure (the upper loop can be fixed on a hook just above head level), and:

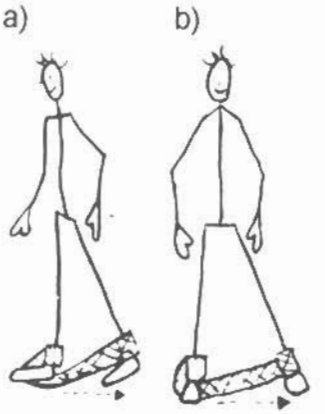
a) extend one arm (shoulder and elbow joints) against the resistance with that wrist kept firm (hold 2 s, rest 2 s, 8 times);

b) repeat with the other arm.

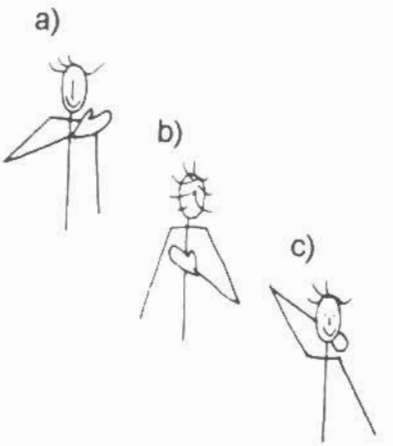


6. Put one foot in each loop of the rubberband. Stand up (you may need support for one hand), and:
a) put your left foot on the middle of the rubberstrip (to make it shorter), and extend your right leg backwards against the resistance (hold 3 s relax 3 s, 8 times);
b) extend your right leg to the side against the resistance (hold 3 s, relax 3 s, 8 times);
c) repeat a) with the other leg;
d) repeat b) with the other leg.

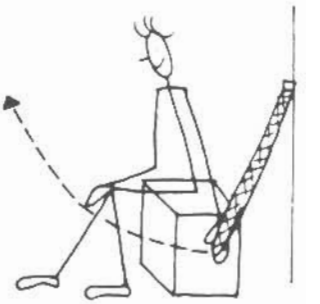
Note: Do not bend while extending your legs.



7. Sit on the stool while you:
a) alternately move your right and left hands to the opposite shoulder (4 times);
b) alternately move your right and left hands behind your back to the opposite shoulder blade (4 times);
c) alternately move your right and left hands behind your neck towards the opposite shoulder blade (4 times).



8. Sit on the stool with your back to the door of which you have put the loop of the rubberstrip around the handle, and:
a) put the other loop around your right hand (all the way into the web of your thumb), and lift your right arm forwards - upwards to shoulder level against the resistance (hold 2 s, rest 2 s, 8 times);
b) repeat with the other arm.



9. Sit on the stool. Grasp the edge of the stool with your right and left hands respectively, while leaning to the opposite side. Feel the stretch. (8 times on each side).

The exercise program also includes a daily 15-minute walk, which you can do whenever you want, and not necessarily in connection with the above exercises.

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