

EXTENDED REPORT

High intensity exercise or conventional exercise for patients with rheumatoid arthritis? Outcome expectations of patients, rheumatologists, and physiotherapists

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Objective: To examine the outcome expectations of RA patients, rheumatologists, and physiotherapists regarding high intensity exercise programmes compared with conventional exercise programmes.

Methods: An exercise outcome expectations questionnaire was administered to 807 RA patients, 153 rheumatologists, and 624 physiotherapists. The questionnaire consisted of four statements regarding positive and negative outcomes of high intensity exercise programmes and four similar statements for conventional exercise programmes. A total expectation score for both conventional and high intensity exercise was calculated, ranging from –2 (very negative expectation) to 2 (very positive expectation).

Results: The questionnaire was returned by 662 RA patients (82%), 132 rheumatologists (86%), and 467 physiotherapists (75%). The mean (95% confidence interval) scores for high intensity exercise programmes were 0.30 (0.25 to 0.34), 0.68 (0.62 to 0.74), and –0.06 (–0.15 to 0.02), and for conventional exercise programmes were 0.99 (0.96 to 1.02), 1.13 (1.09 to 1.17), and 1.27 (1.21 to 1.34) for RA patients, rheumatologists, and physiotherapists, respectively. In all three respondent groups, the outcome expectations of high intensity exercise were significantly less positive than those of conventional exercise programme.

Conclusions: Despite the existing evidence regarding the effectiveness and safety of high intensity exercise programmes, RA patients, rheumatologists, and physiotherapists have more positive expectations of conventional exercise programmes than of high intensity exercise programmes. Physiotherapists were the least positive about outcomes of high intensity exercise programmes while rheumatologists were the most positive. To help the implementation of new insights in the effectiveness of physical therapy modalities in rheumatology, the need for continuous education of patients, rheumatologists and physiotherapists is emphasised.

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The applicability of high intensity exercise programmes for patients with rheumatoid arthritis (RA) has long been questioned because of presumed harmful effects on disease activity and joint damage.¹ Conventional exercise programmes with low impact isometric exercises and "range of motion" exercises were therefore advocated. Several studies published in the past decades have proved that high intensity exercise programmes are more effective at increasing physical capacity (muscle strength, physical fitness) compared with conventional exercise programmes and have no detrimental effects on disease activity in selected patient groups.^{2–8}

Based on this evidence, a wider implementation of high intensity exercise programmes into the therapeutic approach of RA patients can now be recommended. Widespread implementation of high intensity exercise programmes could, however, be hindered by negative beliefs of RA patients, rheumatologists, and physiotherapists about the outcome of high intensity exercise programmes.^{9–10} It is known that patients' positive attitude towards exercise programmes is associated with participation in such programmes,¹¹ and with their rheumatologists' belief in the exercise programmes.⁹ It is conceivable that physiotherapists' beliefs towards high intensity exercise are of equal importance in RA patients' adherence to such programmes. The attitudes of patients, rheumatologists, and physiotherapists towards high intensity exercise programmes have not been studied previously. The aim of this study was therefore to examine the exercise

outcome expectations of RA patients, rheumatologists, and physiotherapists about high intensity compared with conventional exercise programmes.

METHODS

Design

An exercise outcome expectations questionnaire (EOE-Q) was mailed to 807 RA patients, 153 rheumatologists and 624 physiotherapists. The RA patients were all patients in the areas of The Hague and Leiden, and were judged as eligible for participation in a multicentre, randomised controlled trial on the effect of a long term high intensity exercise programme, based on their medical records.⁴ Patients were eligible if, according to their records, they had RA, were aged between 20 and 70 years, lived in the neighbourhood of the research centre, were not bedridden, were not wearing prostheses of a weight bearing joint, and had no severe heart, lung, psychiatric, and/or malignant conditions. The rheumatologists' questionnaire was mailed to all registered members of the Dutch society of Rheumatology (Nederlandse Vereniging voor Reumatologie). The vast majority of those rheumatologists work within a clinic, usually an outpatient clinic. The physiotherapist questionnaire was mailed to a sample of physiotherapists randomly selected from all registered members of the Royal Dutch Society for Physiotherapy (Koninklijk Nederlands Genootschap voor

Abbreviation: EOE-Q, exercise outcomes expectation questionnaire

Fysiotherapie) and the societies for Dutch exercise therapists (Vereniging Bewegingsleer Cesar, Nederlandse Vereniging Oefentherapie Mensendieck). In the Netherlands, exercise therapy can be delivered by physiotherapists, Cesar exercise therapists, and Mensendieck exercise therapists; thus, the term "physiotherapy" in this paper includes these therapies. To limit the number of non-responders, a second questionnaire was mailed to non-respondents after 2 weeks.

Exercise outcomes expectations questionnaire

The EOE-Q was developed based on the questionnaire used by Gecht *et al.*¹⁰ The EOE-Q consisted of two statements on a possible positive outcome and two statements on a possible negative outcome of an exercise programme. The same four statements were applied to both high intensity and conventional exercise programmes. A short definition of "high intensity exercise programmes" and "conventional exercise programmes" was included (textbox 1). The four statements about conventional/high intensity exercise programmes were: "Through regular conventional/high intensity exercise my fitness level would improve and therefore I could do more"; "I think that I will feel better by regularly taking part in conventional/high intensity exercise"; "I think that regular conventional/high intensity exercise will damage my joints"; "I think that conventional/high intensity exercise could cause more inflammation of my RA". The EOE-Q sent to rheumatologists and physiotherapist was identical to that sent to the patients, with the exception that in the statements the determiner was changed from "my" into "RA patients". The four statements could be answered on a Likert scale as follows: "strongly disagree" (-2), "disagree" (-1), "agree" (1), and "strongly agree" (2). A total expectation score (average of four statements) was calculated for both conventional and high intensity exercise, and ranged from -2 (very negative expectation about the outcome) to 2 (very positive expectation about the outcome). A total expectation score was only calculated if all statements were answered. Internal consistency of the EOE-Q was tested with Cronbach's alpha, and varied between 0.43 and 0.70 for items on conventional exercise and between 0.66 and 0.83 for items on high intensity exercise.

In addition, patients, rheumatologists, and physiotherapists were asked for which proportion of RA patients conventional and high intensity exercise would be attainable. This question could be answered on a 5 point Likert scale: attainable for "none/very few RA patients", "a few RA patients", "about half of RA patients", "many RA patients", "(almost) all RA patients". Moreover, rheumatologists and physiotherapists were asked for which patient groups they expected that conventional and high intensity exercise would (not) be attainable. Only physiotherapists and rheumatologists with some experience with RA patients (treating at least one a week) were asked to fill in the EOE-Q.

Demographic and clinical data

In order to be able to describe the research population, questions regarding sex, age, and disease duration were added to the patients' questionnaire. A second questionnaire, the health assessment questionnaire, which has a total score range from 0 (no functional limitations) to 3 (serious functional limitations) was included in order to examine functional ability.¹² The questionnaires for physiotherapist and rheumatologists comprised questions regarding age, hours of patient care per week, and number of years of experience treating RA patients.

Statistical analysis

Differences between expectations of the outcome of conventional and high intensity exercise within the three groups of

respondents were tested with the Wilcoxon test. Differences among patients, rheumatologists, and physiotherapist were tested with the Kruskal-Wallis and χ^2 test, where appropriate. Associations between outcome expectations and age of respondents were examined with Pearson's correlation coefficient.

RESULTS

Response

After two mailings, 662 RA patients (82%), 132 rheumatologists (86%), and 467 physiotherapists (75%) returned the EOE-Q. The questionnaire was completely filled in by 606 RA patients, and by 122 rheumatologists and 119 physiotherapists with at least some experience with RA patients. The median (interquartile range) proportion of missing values concerning the outcome expectations questionnaire was 3.3% (1.6–6.4%). Characteristics of RA patients, rheumatologists, and physiotherapists are presented in table 1.

Outcome expectations

The total scores of the EOE-Q are presented in fig 1. Overall, scores on the EOE-Q concerning conventional exercise programmes were higher (indicating more positive outcome expectations) compared with scores concerning high intensity exercise ($p < 0.001$ for all three respondent groups). With respect to conventional exercise programmes, physiotherapists were most positive followed by rheumatologists and RA patients ($p = 0.010$, $p = 0.174$, and $p < 0.001$ for differences between physiotherapists and rheumatologists, physiotherapists and patients, and rheumatologists and patients, respectively). In contrast, with high intensity exercise programmes, physiotherapists were the least positive while rheumatologists were the most positive ($p < 0.001$ for all differences).

The majority of patients and rheumatologists expected that intensive exercise would be attainable for at least half of all RA patients, whereas the majority of physiotherapists expected that high intensity exercise programmes would be attainable for no or only a few RA patients (fig 2). Furthermore, most rheumatologists (82%) and patients (61%) found high intensity exercise as good as, or better than conventional exercise while the majority of physiotherapists (59%) expected that conventional exercise would be better than high intensity exercise (fig 3). Older rheumatologists and physiotherapists had a less positive expectation of the outcome of intensive exercise ($r = -0.22$ and $r = -0.30$, $p < 0.05$). No statistically significant association was found between the age of rheumatologists and physiotherapists

Table 1 Characteristics of RA patients, rheumatologists, and physiotherapists who completed a questionnaire on outcome expectations of high intensity and conventional exercise

RA patients (n = 606)	
Females, %	74%
Age, years*	56 (47–63)
Disease duration, years*	8 (4–14)
Functional status, HAQ (0–3)*	0.63 (0.25–1.13)
Rheumatologists (n = 122)	
Age (<30/30–45/46–60/>60 years)	0%/52%/45%/3%
Patient care (<24/>24 hours/week)	21%/79%
Years of practice (<5/>5 years)	31%/69%
Physiotherapists (n = 119)	
Age (<30/30–45/46–60/>60 years)	16%/60%/22%/2%
Patient care (<24/>24 hours/week)	30%/70%
Years of practice (<5/>5 years)	13%/87%
Setting (community based/hospital/at home)	79%/8%/16%

*Median (25th–75th percentile).

HAQ, health assessment questionnaire.

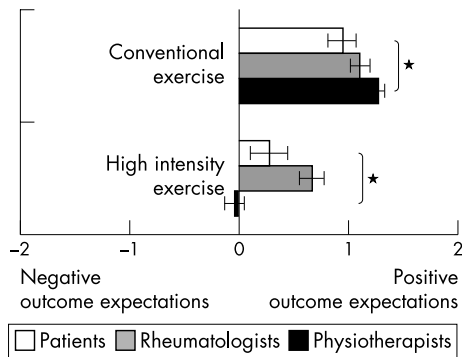


Figure 1 Results of the exercise outcome expectations questionnaire (mean (95% confidence intervals)). Exercise belief scores are presented for conventional and high intensity exercise programmes. Scores can range from -2 (very negative expectation) to 2 (very positive expectation). *All differences between patients (n = 606), rheumatologists (n = 122), and physiotherapists (n = 119) are statistically significant with one exception for the difference between patients and rheumatologists concerning their expectations about conventional exercise.

and their outcome expectations of conventional exercise ($r = -0.10$ and $r = -0.17$, NS).

RA patients for whom, in the opinion of rheumatologists and physiotherapists, high intensity exercise programmes would not be appropriate are presented in table 2. For all presented subgroups of RA patients, with the exception of the group of RA patients with severe joint destruction, the proportion of physiotherapists who believed that high intensity exercise programmes would not be appropriate for that group of patients was larger than the proportion of rheumatologists (table 2). The majority of both rheumatologists (71%) and physiotherapists (86%) expected that high intensity exercise programmes would not be appropriate for RA patients with active disease. In addition, more than half of the rheumatologists (64%) and half of the physiotherapists expected that high intensity exercise programmes would not be appropriate for RA patients with severe joint destruction. The opinion of physiotherapists and rheumatologists regarding patients with at least five swollen joints, patients >60 years, or patients with prostheses in the lower extremity differed significantly. Physiotherapists were less optimistic with respect to the appropriateness of high intensity exercise programmes for these patient groups compared with rheumatologists.

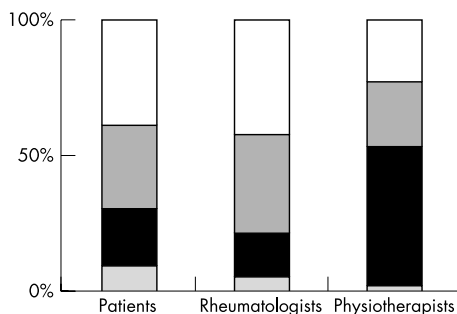


Figure 2 Proportions of patients, rheumatologists, and physiotherapists believing that high intensity exercise is attainable for no or a few RA patients (black bands), about half of all RA patients (upper grey bands), and for many or all RA patients (white bands). The proportion of respondents without an opinion is shown by the lower grey bands.

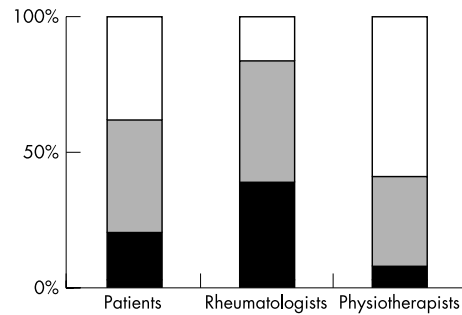


Figure 3 Percentages of patients, rheumatologists, and physiotherapist agreeing with the statements high intensity exercise is better than conventional exercise (black bands), is as good as conventional exercise (light grey bands) and conventional exercise is better than high intensity exercise (white bands).

DISCUSSION

The results of this study showed that in general, RA patients, rheumatologists, and physiotherapists are more positive about the outcomes of conventional than of high intensity exercise programmes. Physiotherapists had the most positive expectations of conventional exercise and the least positive expectations of high intensity exercise.

These results are based on a large survey study of patients, physiotherapists and rheumatologists with a high response rate. As 86% of all Dutch rheumatologists responded, it is plausible that the results are generalisable to all rheumatologists. With respect to the selection of patients, it must be taken into consideration that only patients eligible for participation in a randomised trial on high intensity exercise were sent a questionnaire. The conclusions concern, therefore, only the attitude of a selected group of RA patients. This selected patient group represents, however, a large proportion of all RA patients and is the group of interest for implementation of high intensive exercise programmes.¹³ Selection has also occurred for physiotherapists because only physiotherapists with at least some experience with RA patients were asked to respond. This "experienced" group

Table 2 Proportions of rheumatologists and physiotherapists agreeing with the statement that for certain groups of RA patients vigorous exercise programme is not attainable

	Rheum (n = 122)	Physio (n = 119)	Diff*
Vigorous exercise programmes are not attainable for:			
patients with active disease	71	86	ns
patients with severe joint destruction	64	50	ns
patients with at least 5 swollen joints	28	70	p<0.005
patients with impaired ADL (function)	26	26	ns
patients with many complaints in lower extremity	24	36	ns
patients with many complaints in upper extremity	20	30	ns
elderly patients (>60 years)	19	39	p<0.005
patients with prostheses in the upper extremity	13	13	ns
patients with prostheses in the lower extremity	13	35	p<0.005
Vigorous exercise programmes are good for:			
all RA patients	17	7	ns
no RA patient at all	3	14	p<0.005

Proportions given as percentages.

*P value adjusted for multiple comparisons according to the Bonferroni method (0.05/11).

Rheum, rheumatologists; Physio, physiotherapists, Diff, difference; ADL, activities of daily living.

appears to be 25% of all responded physiotherapists. However, because the other 75% of therapists will on a yearly basis treat no or only a very few RA patients, their expectations about the outcome of exercise programmes is of less interest. The expectations of these "inexperienced" physiotherapists remain unknown.

The EOE-Q used in the study was developed from a questionnaire used by Gecht *et al.*¹⁰ Internal consistency of this modified questionnaire was tested and was "good" for the high intensity exercise items and "moderate" for the conventional exercise items. Nevertheless, significant differences between patients, rheumatologists, and physiotherapists were found; these differences may result from differences in valuing terms such as "conventional" and "high intensity". The differences between these programmes were, notwithstanding the definition added to the questionnaire, possibly less clear for rheumatologists and patients than for physiotherapists.

The results of this study are in accordance with the outcome of a study published by Iversen *et al.*⁹ In that study, clinical encounters were audiotaped and analysed to identify characteristics of exercise discussions between rheumatologists and patients with RA. One of the conclusions drawn was that rheumatologists' beliefs regarding the usefulness of exercise for RA varied, with the least positive beliefs being reported for aerobic exercise.

Patients, rheumatologists, and physiotherapists with negative outcome expectations of high intensity exercise will prefer conventional exercise or even no exercise to high intensity exercise, notwithstanding the proven ineffectiveness of conventional exercise.¹⁴ The fear of RA patients, rheumatologists, and physiotherapists of negative outcomes of high intensity exercise programmes can be explained by the historical view on exercise in RA.¹ Until recently, it was believed that high intensity exercise would aggravate disease activity and joint damage in patients with RA; however, this is not based on sound scientific evidence. It has been demonstrated in a number of studies that many RA patients can participate in high intensity exercise programmes without an increase in disease activity.^{2,6} Even in active disease

RA patients are able to perform a high intensity exercise programme.¹⁵ Only a few studies have examined the effect on joint damage but all concluded that high intensity exercise programmes would, in general, not lead to extra joint damage.^{4,5,16} At most, caution may need to be taken only with a small subgroup of patients with severe joint damage.

In our study, physiotherapists were more conservative than rheumatologists regarding high intensity exercise programmes. This may be explained by inexperience and insufficient rheumatology education of many general physiotherapists. It appears that physiotherapists are, more than rheumatologists, insufficiently informed with respect to the scientific evidence regarding exercise in RA. This is further emphasised by the fact that only 25% of all physiotherapists who responded thought themselves experienced enough to answer the questions regarding the expected outcome of high intensity and conventional exercise in RA. Continuous education and specialisation of physiotherapists within hospital based and community based networks of may be an important development to counteract this deficiency and to help the implementation of new insights into the effectiveness of physical therapy modalities in rheumatology.¹⁷

We found in our study that, despite the relatively negative outcome expectations of high intensity exercise compared with conventional exercise, the majority of both patients and rheumatologists and a minority of physiotherapists expected that intensive exercise would be attainable for the majority of all RA patients. Most effectiveness studies give no answer on the question of which proportion of all patients high intensity exercise might be attainable. In clinical trials, only a small number of selected patients can be included, questioning the generalisability of the results to other patients. To gain insight in the generalisability of exercise trials, de Jong *et al.* compared participants of a randomised controlled trial with non-participants.¹³ They found that out of all identified RA patients in a region, 74% was found to be eligible for participation in a high intensity exercise group. In most cases patients were not eligible because of their age (not between 20 and 80 years), functional status (Steinbrocker class IV), or presence of joint prosthesis. Eventually only 18% of all eligible patients participated in the study. The effectiveness study demonstrated that the high intensity exercise programme was safe for the majority of all participants except perhaps for a small minority of patients with severe baseline joint damage.⁴ Taking into account that the clinical characteristics of the participants did not differ from non-participants, we estimate that an intensive exercise programme is theoretically attainable for at least 50–70% of all RA patients.

Perceived benefit of exercise is a significant predictor of exercise participation.^{18–20} It is the task of both rheumatologist and physiotherapist to discuss exercise with their RA patients, using all scientific evidence available, and convince their patients of the positive consequences of high intensity exercise in the long term.¹⁸

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Textbox 1: Definition of a conventional and high intensity exercise programme as included in the EOE-Q

A conventional exercise programme

- A programme consisting of calmly performed exercises for the joints not leading to tiredness, for example, bending and stretching of the arm. Conventional exercises are not comparable with fitness training or sports.

A high intensity exercise programme

- An exercise programme consisting of exercises for the whole body leading to tiredness. Intensive exercise resembles fitness training but is not identical. In both fitness training and intensive exercise programmes, physical fitness and muscle strength are trained. The difference is that an intensive exercise programme is performed under supervision of a physiotherapist and is geared to the capabilities of each patient. An example of an intensive exercise programme is 15 minutes of cycling, followed by 30 minutes of exercises for fitness and muscle strength, followed by a game.

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