

## A RANDOMIZED PROSPECTIVE STUDY OF VOCATIONAL OUTCOME IN REHABILITATION OF PATIENTS WITH NON-SPECIFIC MUSCULOSKELETAL PAIN: A MULTIDISCIPLINARY APPROACH TO PATIENTS IDENTIFIED AFTER 90 DAYS OF SICK-LEAVE

M. Lindh, M. Lurie and H. Sanne

*From the Department of Rehabilitation Medicine, University of Göteborg, Göteborg, Sweden*

**ABSTRACT.** This study was designed to evaluate the effectiveness of a multidisciplinary rehabilitation programme offered to a general population with 90 days of sick-leave due to non-specific musculoskeletal pain. The results concerning return to work and re-sick-listing during a follow-up period of five years were evaluated for Swedes and immigrants separately. Compared to a control group, the rehabilitation offer resulted in improved work stability after work return among the Swedes. The immigrants, as a group, did not benefit from the programme compared to the controls in primary care.

*Key words:* multidisciplinary rehabilitation, non-specific musculoskeletal pain, re-sick-listing, work return.

Chronic musculoskeletal pain of "non-specific" origin is difficult for the individual to cope with but is also a growing challenge for the health-care and insurance systems in the industrialized countries (5, 6, 14).

Patients with pain symptoms of illness rather than disease often are given vague diagnoses in medical care, creating a feeling of frustration in both the patient and the medical staff. With poor results from single treatment modalities, the patient consults new doctors and therapists. With no cure forthcoming, sick-leave is continued and work return postponed.

In the late 1980s the frequency of long-lasting sick-leave and disability pensions in Sweden was focused upon, and since then there has been increasing pressure from the government on the social insurance system to lower the average number of days of sickness cash benefit per capita per year. Since 1990 there has been considerable concentration on vocational rehabilitation, parallel with cuts in an earlier very liberal system for sickness benefit (13).

This study from the Department of Rehabilitation

Medicine, Göteborg, Sweden, was planned in 1987 before the real breakthrough of a nation-wide rehabilitation drive. By then, the annual incidence of patients sick-listed for 90 consecutive days in Göteborg was calculated to be 5.4%. Diagnoses exclusively of "non-specific" musculoskeletal pain amounted to 1.7% (11). From this target group, patients were consecutively randomized to a control group and invited to participate in a rehabilitation programme.

The focus of the study was the vocational outcome with the hypothesis that a multidisciplinary rehabilitation programme, suited to the patient's ability, would: (1) increase the chance for work return, and (2) lead to a reduced need for sick allowance after return to work.

Since cultural factors have shown an impact on rehabilitation outcome (3, 4, 7, 9) the vocational benefit of the programme was evaluated for Swedes and immigrants separately.

### MATERIALS AND METHODS

#### *Patients*

All Swedes and foreign citizens of 16-65 years of age, at a salary of at least SEK 6000 (~US \$ 800) per annum are insured for sick benefit through the Swedish Social Insurance System and their sick-leaves are registered. Seven out of twelve social insurance offices in Göteborg, covering 66% of the working population in the city, were asked for a weekly report of cases reaching a continuous sick-leave of 90 days. The card indexes of the sick-listed persons reported were checked according to the doctor's diagnosis, and those with diagnoses of pain symptoms indicating "non-specific" diagnoses were identified, i.e. chronic musculoskeletal pain, fibromyalgia, neck and shoulder pain, back pain, and similar conditions.

From those identified the following preset inclusion criteria had to be met: <56 years of age, <180 days sick-listing in the preceding two years, no on-going rehabilitation, no partial sick-leave and no pregnancy. Out of 4010 consecutive cases with a "non-specific" diagnosis 611 fulfilled the inclusion criteria and were assigned to a randomized rehabilitation group,  $n = 315$ , and a randomized control group,  $n = 296$  (Fig. 1).

A letter was sent to the patients assigned to rehabilitation with

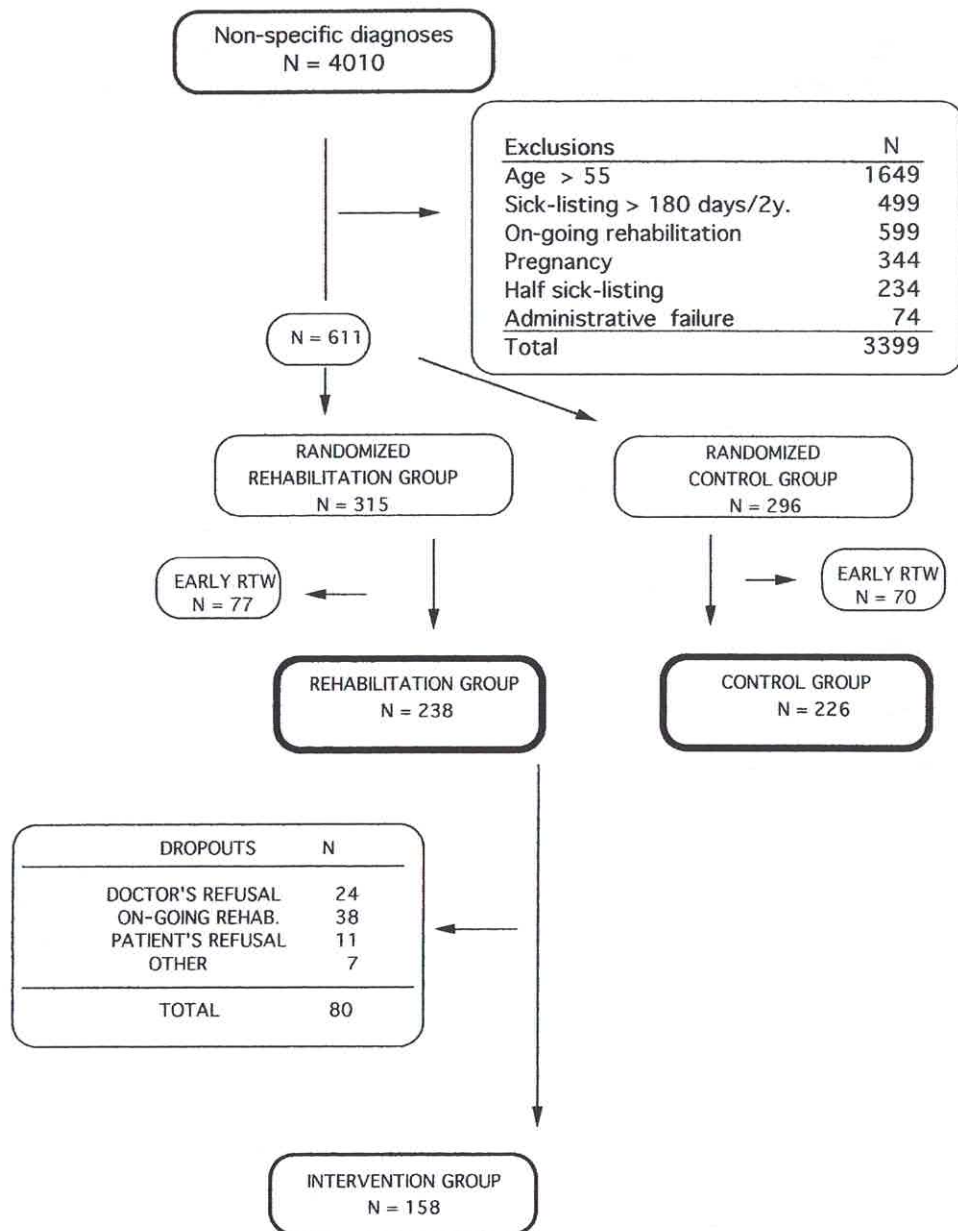


Fig. 1. Study design.

an invitation to the programme at the Outpatient Rehabilitation Clinic, and their doctors were informed for consent. Seventy-seven cases identified for rehabilitation returned to work before the invitation to the clinic was issued and were therefore excluded from the study. During a corresponding period of time work-returners among the controls were identified by a statistical procedure. The procedure entailed a "first-visit date" being simulated by the computer for each control under the same time conditions as those for work-returners in the randomized rehabilitation group. Those who had returned to work before this "first-visit date" were classified as early returners and were excluded ( $n = 70$ ).

There were no significant differences between the final rehabilitation group (RG),  $n = 238$ , and the final control group (CG),  $n = 226$ , for age, sex, nationality, occupational status, or sick-leave frequency during the preceding two years. There was a slight difference between the two groups regarding the location of the main pain in patients according to the doctor's certificate (Table I).

Of those invited to the RG, 80 patients did not respond to the invitation mainly because of their own or their doctor's refusal, or because of an already initiated rehabilitation programme elsewhere (Fig. 1). The dropouts were included in the RG for statistical reasons although the actual intervention group (IG)

Table I. Demographic characteristics of the study population

	Rehabilitation group	Control group	Significance of difference
Number	238	226	
Age	39.0 range 20-55	40.0 range 21-55	n.s.
Sex (% women)	63.0	61.0	n.s.
Civil status (% married)	68.0	76.0	n.s.
Nationality (% Swedes)	62.5	60.0	n.s.
Sick-leave during the preceding 2 years (days $\pm$ SD)	80.0 ( $\pm$ 54.0)	77.0 ( $\pm$ 49.5)	n.s.
Location of pain (%)			
Neck-arm	33.0	30.5	
Shoulder	20.5	14.0	chi <sup>2</sup>
Low back	27.0	22.0	$p < 0.05$
Neck + low back	8.5	13.0	
Other combinations	11.0	20.5	
Occupation (%)			
Graduated	3.0	6.0	
Nursing	12.0	13.0	
Office	7.0	4.0	
Cashier	5.0	4.5	chi <sup>2</sup>
Cleaning	17.5	14.0	n.s.
Blue collar	35.5	41.0	
Transport	7.5	4.0	
Hotel	10.0	11.0	
Unemployed	2.5	2.5	

constituted 158 patients. For analysis of the dropouts, demographic characteristics for the IG contra the dropouts can be found in Table II. The native countries of the immigrants can be identified in the IG (Table III).

All patients included in the study were informed about voluntary participation. All data were handled in strict confidence by use of codes.

#### Rehabilitation model

The rehabilitation was conducted through an outpatient regime. The rehabilitation team consisted of a doctor, specialized in rehabilitation, a nurse, a physiotherapist, a psychologist, a social worker, an occupational therapist, and a vocational counsellor. The rehabilitation programme and the patients' contacts with the team members were guided by the multidisciplinary evaluation of the patients. The duration of the rehabilitation period was individually regulated.

**Patient evaluation.** All patients met the doctor for a thorough interview including a review of earlier investigations and for a physical examination with, if necessary, the possibility of supplementary laboratory tests and medical consultations. Other team members were involved according to the need for further functional, psychological and social assessments.

**Goal setting.** During a subsequent team conference the team members, with regard to the multidisciplinary evaluation, ranked the possible rehabilitation obstacles to be taken into account in planning the patients' individual programmes and goals for rehabilitation.

**Programme planning.** The programme was planned and thereafter guided by the team members involved. In weekly conferences with the team, each case was discussed and re-evaluated if necessary. Step-by-step goals were checked and agreed upon with the patients in regular meetings in which spouses' participation was encouraged (12).

**Rehabilitation completion.** The rehabilitation process was completed and the outcome communicated to the patient's general practitioner:

- \* when the patient was able to return to work;
- \* when the patient was able to proceed in making contact with AMI (the Work Evaluation Unit governed by the Labour Market);
- \* when there was a recommendation for prolonged sick-leave or disability pension based upon a medical judgement of incapacity for work;
- \* when the patient showed no compliance toward programme or goal.

Specific interventions carried out by the team were:

**Physiotherapist:** Individual and/or group sessions for pain treatment modalities, relaxation, stretching, strength and fitness exercises, and ergonomic education.

**Psychologist:** Individual and group sessions with a cognitive-behavioural approach, emphasizing psychological reactions on pain, fear and avoidance behaviour, perceived illness, beliefs and expectations, stress management, and coping strategies.

Table II. Demographic characteristics of the rehabilitation group (RG) divided into the intervention group (IG) and dropouts

	Intervention group	Dropouts	Significance of difference
Number	158	80	
Age	39.0 range 20-55	41.0 range 20-55	n.s.
Sex (% women)	61.0	68.0	$p < 0.05$
Civil status (% married)	68.0	76.0	$p < 0.05$
Nationality (% Swedes)	60.0	69.0	$p < 0.05$
Sick-leave during the preceding 2 years (days $\pm$ SD)	80.0 ( $\pm$ 54.0)	78.0 ( $\pm$ 49.0)	n.s.
Location of pain (%)			
Neck-arm	28.5	37.0	
Shoulder	25.0	16.5	$\chi^2$
Low back	27.0	25.0	$p < 0.05$
Neck + low back	9.5	8.0	
Other combinations	10.0	13.0	
Occupation (%)			
Graduated	2.5	3.5	
Nursing	14.5	9.0	
Office	5.0	12.0	
Cashier	5.3	3.0	$\chi^2$
Cleaning	19.0	14.0	n.s.
Blue collar	38.0	31.5	
Transport	4.0	10.5	
Hotel	12.0	11.0	
Unemployed	0.0	5.5	

*Social worker:* Family counselling, social support, assistance where there was a need for contact with people in authority.

*Occupational therapist and vocational counsellor:* Professional support in patients' contact with employers and organizers of the work, preparations, outlines and follow-ups of vocational training in the workplace. For unemployed patients, recommendations to AMI to further the vocational process.

Table III. The native country of the immigrants in the intervention group (IG) ( $n = 62$ ) and their stay in Sweden

Native country	<i>n</i>	%	Years in Sweden
Finland	17	27.5	18 (1-38)
Other Scandinavian countries	3	4.8	13 (9-17)
Yugoslavia	16	25.8	17 (4-29)
Arabian countries	7	11.3	6.5 (4-13)
Turkey	5	8.5	14.5 (4-21)
Greece	2	3	21 (19-23)
China	2	3	5 (4-6)
Eastern Europe	3	4.8	7 (4-9)
Other countries*	7	11.3	7 (4-9)

\*Germany, Spain, Portugal, Uruguay, Pakistan, Morocco, Gambia.

#### Follow-up

The patients in the RG and the CG were followed for 5 years from the the first day of sick-leave. The follow-up required a continuous supply of information from the register in the social insurance offices with the possibility of delineating the curve for return to work (RTW) and the actual working status of the individuals during the follow-up period, with the latter taking into account the amount of re-sick-listing after RTW.

#### Statistics

A conventional univariate analysis was used to describe demographic characteristics and test results. Comparisons between groups were performed with the usual *t*-tests. In the case of return to work (RTW) and re-sick-listing, survival curves were compared using a likelihood ratio test (10).

## RESULTS

*Return to work (RTW):* i.e. the actual, part-time or full-time, return to work during the follow-up period from the 90th day of sick-leave, regardless of work stability. *Swedes (Fig. 2):* 50% of the patients in the RG returned to work within 9 months from the 90th day of sick-leave, whereas in the CG 50% were back within 6 months. At 12 months of follow-up 73% had returned to work in both

## Swedes

Rehab. = 151 Control = 134

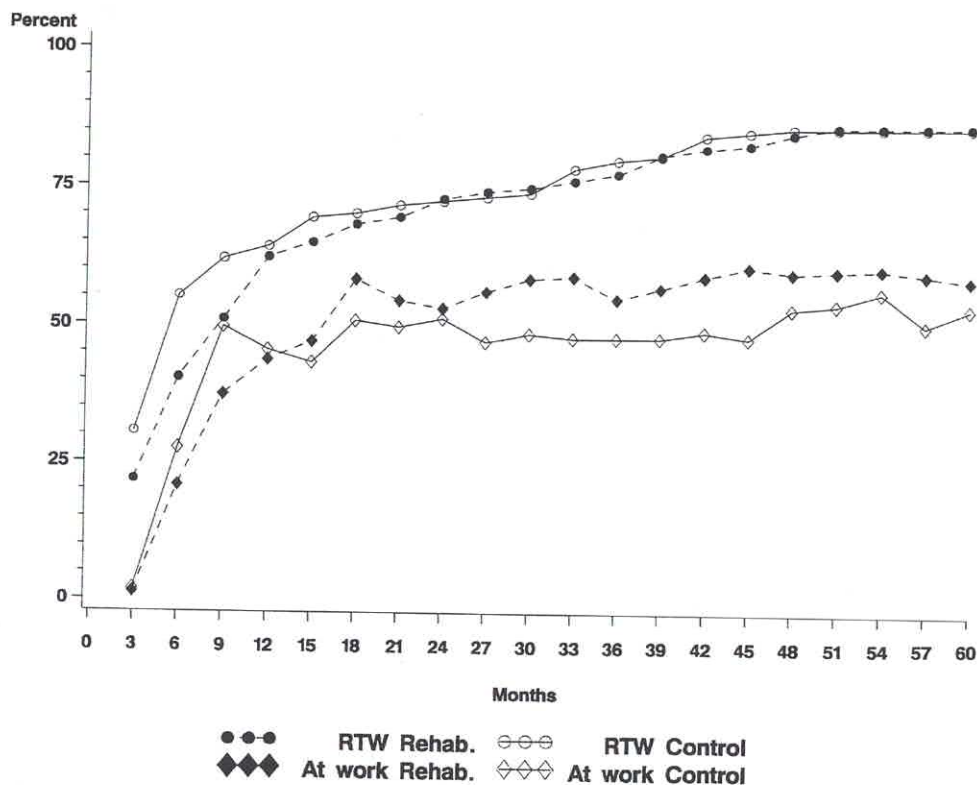


Fig. 2. The rate of work return (RTW) registered at 3-month intervals in Swedes from the rehabilitation group (RG) and from the control group (CG). The bottom lines depict the percentage of Swedish patients at work during the time of follow-up, registered at 3-month intervals, in the RG and in the CG. On the x-axis, 0 = the 90th day of sick-leave.

the RG and the CG. Thereafter, the slope was almost parallel for the groups, with a slight increase up to about 80% at three years' follow-up, and 85% at five years.

*Immigrants (Fig. 3):* 50% of the immigrants in the rehabilitation group had one return to work after about 24 months with a corresponding percentage within six months in the control group. The gap between the groups was obvious throughout the follow-up. At three years of follow-up 63% of the RG patients contra 75% of the CG subjects had one return to work. At five years of follow-up the percentage was 68% and 78%, respectively.

#### At work during follow-up

*Swedes (Fig. 2):* The percentage of patients actually working at a follow-up of 12 months after the 90th day of sick-leave was the same for the RG and the CG (45%). Before that, the work values were somewhat higher in

the CG than in the RG but with a reverse condition after the first year. After three years the difference tended to favour the rehabilitation group with 55% contra 47% in the control group. There was still a slight difference after five years with 58% in the RG and 52% in the CG. *Immigrants (Fig. 3):* The percentage of patients actually working at a follow-up of 12 months showed no significant difference between groups, but before and after this checkpoint the percentage was in favour of the control group. At the follow-up after two years, 40% in the CG were at work contra 25% in the RG. The difference was ruled out after three years, and after five years 36% in the RG were registered at work contra 31% in the CG.

#### Number of sick-listed days after RTW

Among *Swedes* in the RG the mean number of sick-listed days in six-month periods during three years after RTW was lower compared to the number in the CG (Fig. 4).

### Immigrants Rehab.=87 Control=92

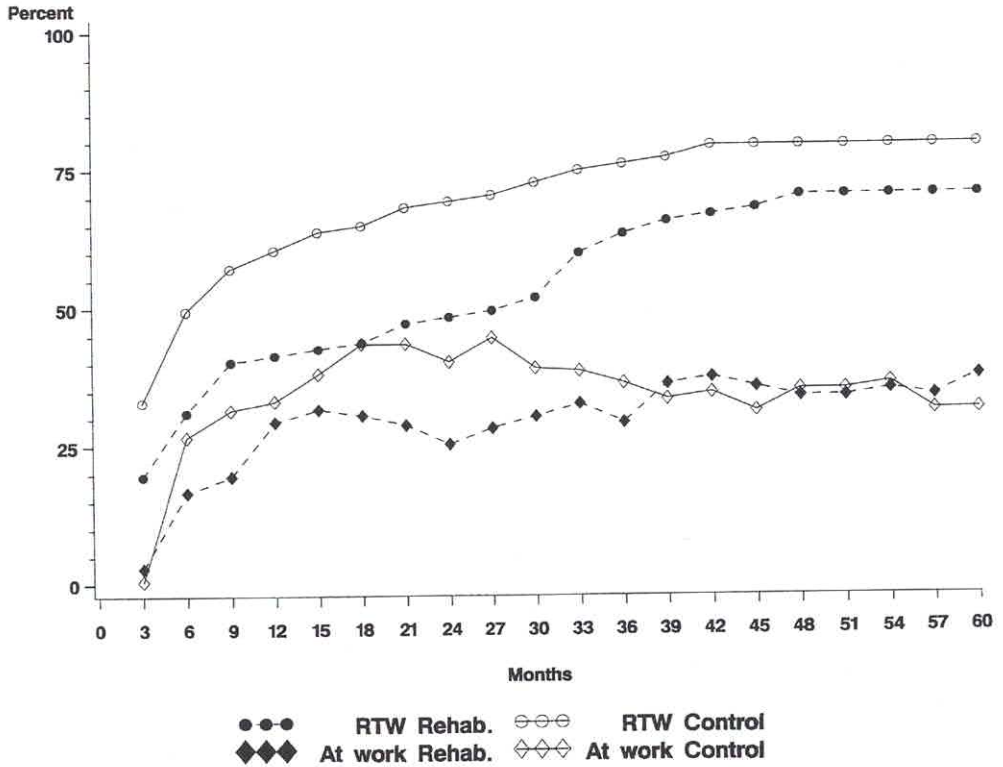


Fig. 3. The rate of work return (RTW) registered at 3-month intervals in immigrants from the rehabilitation group (RG) and from the control group (CG). The bottom lines depict the percentage of immigrant patients at work during the time of follow-up, registered at 3-month intervals, in the RG and in the CG. On the x-axis, 0 = the 90th day of sick-leave.

Among immigrants, no consistent difference was observed between the RG and the CG (Fig. 4).

The results of the RG included a dropout of 80 patients according to the study design. Separate results for the IG, i.e. for those patients who took part in the rehabilitation programme can be found in Figs. 5 and 6, as can the dropouts in Figs. 7 and 8.

#### DISCUSSION

Multidisciplinary rehabilitation programmes are widely used in the management of musculoskeletal pain problems. A meta-analytic review of their efficacy by Flor et al. in 1992 (8) tended to reflect a favourable view of their use, despite considerable differences in outcome, and difficulties in making evaluations due to different study designs.

The aim of this study was to look upon the merits of

a multidisciplinary approach in the rehabilitation of patients long sick-listed because of musculoskeletal pain/ache of so-called non-specific origin. To evaluate this approach the study was designed to offer rehabilitation to a city population in general, fulfilling the criteria of three months of continuous sick-leave due to diagnosed non-specific musculoskeletal pain, without considering any possible pros or cons for rehabilitation in any aspects besides the above-mentioned main criteria and specific exclusion criteria concerning age, previous sick-leave, defined on-going rehabilitation, on-going half sick-leave or known pregnancy.

Demographically representative social insurance offices consecutively offered the target population which was randomly assigned to a rehabilitation group (RG) and to a control group (CG). This procedure, in spite of some specific exclusion criteria, entitles the study to deal with a non-selected "general patient population".

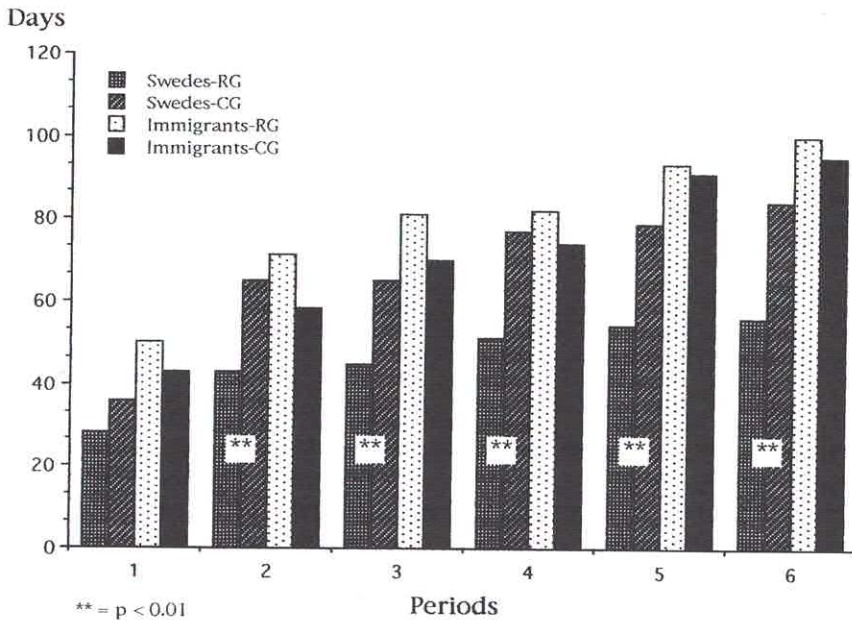


Fig. 4. The mean number of sick-listed days during 6-month periods after return to work (RTW) for Swedes and immigrants in the rehabilitation group (RG) and control group (CG), respectively.

A negative consequence of the design was a great number of dropouts who did not accept the invitation to the RG, claiming they had no need of the rehabilitation offered. For this reason the dropouts might have constituted a healthier proportion of the invited group. Thus, intervention was possible for 67% of the RG, the so-called intervention group (IG). Nevertheless, the results were focused on the RG, although including the dropouts, for the purpose of being able to relate the social benefit of the actual offer of a rehabilitation set-up to a "general population". The outcome is, however, also given for the intervention group and the dropouts, separately.

The CG, by definition above, also constituted a non-selected general, patient population. Being in the control group did not preclude treatment. In primary care, physiotherapy is usually prescribed for patients with musculoskeletal pain problems and therefore other professionals in rehabilitation can also more or less be involved, depending on the physician's awareness of the patient's need for rehabilitation. At the time of the study it was also the duty of the insurance official to ask the physician for a work prognosis on sick-leave assignments of more than 90 days. This duty was, however, not routinely discharged, but the present study may have revived the routine with some effect on doctors' prescribing of rehabilitation measures.

A subsample of the CG ( $n = 62$ ) was, for reasons other than the present study, interviewed at the insurance office concerning quality of life ideas and was re-interviewed by mail after one year, but otherwise the CG was not interfered with. A possible influence on attitudes may have occurred.

The study was aimed to turn to patients with continuous sick-leave of 90 days. In reality, rehabilitation did not start immediately due to time-consuming administration consisting of reports from the insurance offices, invitation letters to and approval from patients and doctors. During the "administration time" 77 patients assigned to rehabilitation returned to work before the invitation was issued and were therefore excluded. The importance of the actual offering of a rehabilitation programme for work return can only be speculated on. The occurrence of work return before the start of the study was accounted for even in the controls with the exclusion of work-returners during the same period.

Because of variations in administration time the start of rehabilitation differed among the patients in the intervention group, one of the reasons for delineating the rate of work return from the 90th day of sick-leave. This way of reporting the result also seems perfectly adequate, since the rehabilitation process was individually set with no preset endpoint. Another reason concerns the interest in looking at the total length of

**Intervention group**  
Swedes=96 Immigrants=62

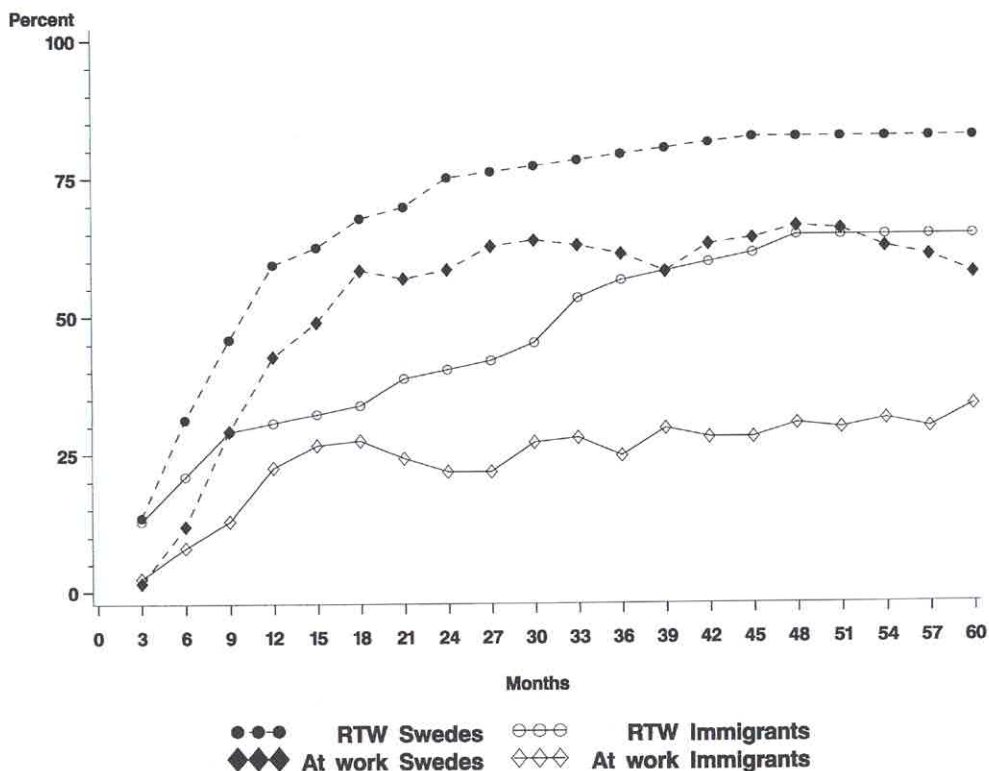


Fig. 5. The rate of work return (RTW) in the intervention group (IG) for Swedes and immigrants, and the percentage of patients at work during the time of follow-up. The recordings are made at 3-month intervals. On the x-axis, 0 = the 90th day of sick-leave.

sick-leave assignments from study start to follow-up after five years, irrespective of type of intervention.

The hypothesis of the study outcome of an increased frequency of work-returners in the RG was not fulfilled.

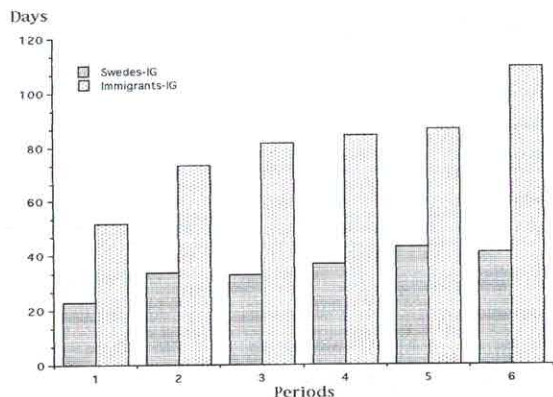


Fig. 6. The mean number of sick-listed days during 6-month periods after return to work (RTW) for Swedes and immigrants in the intervention group (IG).

Among Swedes the percentage of work-returners was similar in the long run in the RG and the CG. A faster initial rate of work return in the CG may be due to the change of care given and to the time of rehabilitation measures undertaken in the IG. The work stability after once having returned to work was, however, more favourable for the RG. Also the number of sick-leave days after return to work were fewer in the RG. With these results the second hypothesis concerning improved conditions for work stability was fulfilled to a certain extent. The concept of the rehabilitation programme is suggested to have a favourable effect on a general patient population of Swedes when it comes to influence on attitudes and self-coping strategies for vocational stability.

The programme, however, failed concerning a general patient population with immigrant status. The reasons for the inferior results found for vocational outcome in the RG require to be investigated. Without generalizing, the patients with immigrant status in the IG



**Dropouts**  
Swedes=55 Immigrants=25

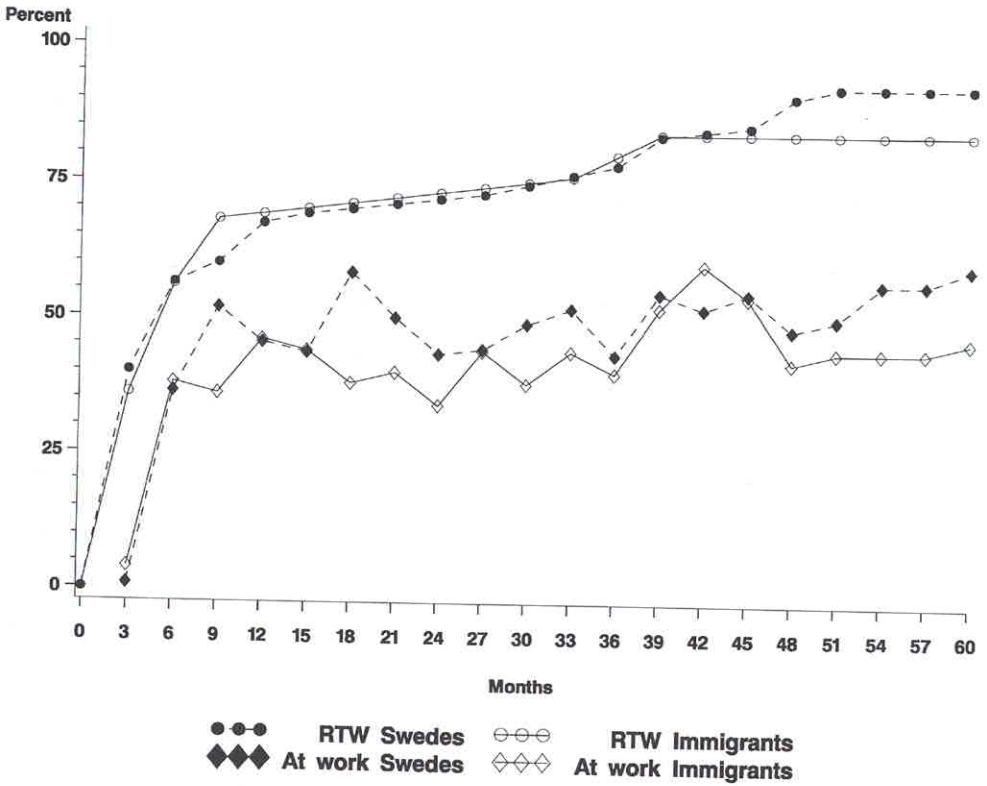


Fig. 7. The rate of work return (RTW) in the group of dropouts for Swedes and immigrants, and the percentage of patients at work during the time of follow-up. The recordings are made at 3-month intervals. On the x-axis, 0 = the 90th day of sick-leave.

communicated percentually more frequently widespread ache with a pain-communication difficult to answer to with a cognitive-behavioural approach. Efforts from the team to focus on ability rather than inability seemed to

make the patient more eager to demonstrate impaired function, with the resultant feeling of frustration at not being helped, and not being able to help on the part of patient and team members respectively. An awareness on the part of team members of a sociocultural impact on patients' behaviour and expectations was not sufficient to handle the problem in the sense of making the patient conscious of its impact. Such a failure may have led to an increased disposition towards recommendation for disability pension in the IG compared to the CG, perhaps a release for the patient but not so from the point of view of society in terms of sickness-benefit costs. Clearly, a cognitive-behavioural approach to rehabilitation requires a thorough knowledge of culturally imprinted cognitions if it is to succeed when confronted with foreign cultures.

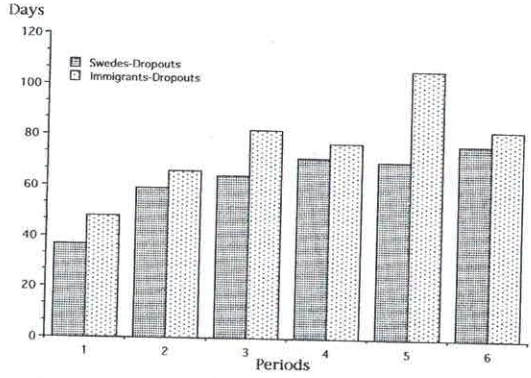


Fig. 8. The mean number of sick-listed days during 6-month periods after return to work (RTW) for Swedes and immigrants in the group of dropouts.

When studies of rehabilitation outcome are compared, the results must be interpreted cautiously with regard to differences in study design, a recommendation pointed out by, among others, Aronoff et al. (1, 2), Turk et al. (15-18), and Flor et al. (8).

In an evaluation of the efficacy of rehabilitation for vocational outcome not only work return but also work stability and relapses during follow-up must be considered, not least in order to discuss the economic benefits which are dependent on long-term results.

For those who returned to work, irrespective of group, the number of re-sick-listed days was in excess of the mean number of sick-listed days for the population in Sweden (13), which indicates an increased vulnerability in patients once long-term sick-listed.

Provided that it is culturally established, the present study, to a certain extent, demonstrates the benefits of a multidisciplinary rehabilitation programme concerning work stability and reduced re-sick-listing in an unselected patient population, long-term sick-listed for non-specific musculoskeletal pain and ache, compared to a control group.

The recommendation in clinical work is, however, to initiate rehabilitation measures earlier during sick-leave and to select patients for rehabilitation after an assessment, of the individual's rehabilitation potential.

Factors influencing rehabilitation results will be dealt with in a forthcoming study of rehabilitation obstacles.

#### ACKNOWLEDGMENTS

This work was supported by grants from The Swedish Work Environment Fund, The AMF-trygghetsförsäkring, and The Greta and Einar Asker Foundation.

The study design was approved by the Ethical Committee, and by the Data Inspection in Sweden.

#### REFERENCES

1. Aronoff, G. M., Evans, W. O. & Enders, P. L.: A review of follow-up studies of multidisciplinary pain units. *Pain* 16: 1–11, 1983.
2. Aronoff, G., McAlary, P. W., Witkower, A. & Berdell, M.: Pain treatment programs: Do they return workers to the workplace? *J Occup Med* 3: 123–136, 1988.
3. Bates, M. S. & Rankin-Hill, L.: Control, culture and chronic pain. *Soc Sci Med* 39: 629–645, 1994.

4. Bates, M. S., Edwards, W. T. & Anderson, K. O.: Ethno-cultural influences on variation in chronic pain perception. *Pain* 52: 101–112, 1993.
5. Bowsher, D., Rigge, M. & Sopp, L.: Prevalence of chronic pain in the British population: a telephone survey of 1037 households. *Pain Clin* 4: 223–230, 1991.
6. Brattberg, G., Thorslund, M. & Wikman, A.: The prevalence of pain in a general population: the results of a postal survey in a county of Sweden. *Pain* 37: 215–222, 1989.
7. Ekberg, K. & Wildhagen, I.: Long-term sickness absence due to musculoskeletal disorders: the necessary intervention of work conditions. *Scand J Rehab Med* 28: 39–47, 1996.
8. Flor, H., Fydrich, T. & Turk, D. C.: Efficacy of multidisciplinary pain treatment centers: A meta-analytic review. *Pain* 49: 221–230, 1992.
9. Greenwald, H. P.: Interethnic differences in pain perception. *Pain* 44: 157–163, 1991.
10. Lawless, J.: Statistical models and methods of lifetime data. Wiley & Sons, Inc, New York, 1982.
11. Lurie, M., Gustafsson, M., Lindh, M., Sanne, H.: Incidence of long-term sick-listing in an urban area of Sweden and its relationship with demographic data of the population. Submitted for publication 1996.
12. Rowat, K. M., Knafl, K. A.: Living with chronic pain. The spouse's perspective. *Pain* 23: 259–271, 1985.
13. "Social Insurance Statistics". National Social Insurance Board, Mathematical-Statistical Division, Stockholm, Sweden, 1988, 1991.
14. Spengler, D., Bigos, S. J., Martin, N. Z., Zeh, J., Fisher, L. & Nachemson, A.: Back injuries in industry: a retrospective study I. Overview and cost analysis. *Spine* 11: 241–245, 1986.
15. Turk, D. C.: Customizing treatment for chronic pain patients: Who, what, and why. *Clin J Pain* 6: 255–270, 1990.
16. Turk, D. C. & Rudy, T. E.: Neglected factors in chronic pain treatment outcome studies—referral patterns, failure to enter treatment, and attrition. *Pain* 43: 7–25, 1990.
17. Turk, D. C. & Rudy, T. E.: Neglected topics in the treatment of chronic pain patients—relapse, noncompliance, and adherence enhancement. *Pain* 44: 5–28, 1991.
18. Turk, D. C., Rudy, T. E. & Sorkin, B. A.: Neglected topics in chronic pain treatment outcome studies: determination of success. *Pain* 53: 3–16, 1993.

#### Address for offprints:

M. Lindh, MD  
Arbetsrehabcentrum  
Sankt Sigfridsgatan 85  
SE-412 66 Göteborg  
Sweden