

CLINICAL AND SOCIAL FACTORS IN REHABILITATION OF PATIENTS WITH CHRONIC LOW BACK PAIN

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ABSTRACT. Physical signs, medical history and social factors were analyzed and evaluated in 52 patients (17 women and 35 men) with chronic low back pain, in order to determine if any factors were predictive for return to work after rehabilitation. Factors discriminating between the working and sick-disabled groups were:

1. Sex (only men returned to full time work)
2. Duration of sick-leave (the older half of the study population exhibited a negative correlation between time on sick-leave and frequency of return to work)
3. Reported need for analgesics (the working group reported less need of analgesics)
4. Pain in the cervical and dorsal areas of the spine as well as in the lumbar region (less frequent in the working group)
5. The patients' attitude to his own ADL-capacity (those who returned to full-time work were more positive)
6. After work fatigue (less frequent in the working group).

Key words: Chronic low back pain, rehabilitation in low back pain, clinical factors in low back pain, social factors in low back pain

Chronic low back pain (LBP) is a common cause of suffering and disability. The frequency in Sweden is not completely documented, but several studies indicate its magnitude. Helander (7) analyzed a statistical sample of subjects in the Swedish church registry. From 1955 through 1971 31% of all Swedish citizens and 46% of non-Swedish citizens had at some time been off work because of low back pain. The average sickness absence was 39 days; 9% had been off work for more than 3 months.

Svensson & Andersson (12) studied a sample of 40-47 year old men in the city of Göteborg, Sweden. Four per cent were found to have chronic low back pain, defined as sickness absence for 3 months or longer. In another study (13) a similar percentage was found for 35-60 year old women.

Many of these patients are involved in physical and vocational rehabilitation processes. The results of these rehabilitation processes have generally been rather poorly documented.

Brodin & Eriksson (4) studied 47 patients with chronic low back pain who had been given a ten day rehabilitation program with mainly physiotherapy and ergonomic counselling. One year after treatment 70% said they were improved. The sickness absence period in the group was on the average reduced from 58 to 12 days per year.

White (15) conducted a prospective randomized study of patients with chronic low back pain. Ninety-nine patients were treated in a hospital for 6 weeks (mainly physiotherapy) while 95 patients were sent back to their treating physicians for continued care. The rehabilitation effect was measured as work intensity over a three month period following the rehabilitation process. Of those treated in a hospital, 42% were working to a satisfactory degree (defined as work for at least 80% over the three month period), while the corresponding figure for the control group was 16%. White concluded that work placement was more important than medical treatment. Mattingly (8) came to the same conclusion based on a study of 38 dock workers treated for low back pain in a rehabilitation program.

Beals & Hickman (1) studied 180 patients who had injured either their back or limbs. Chronic low back pain was diagnosed in 35. Twenty-nine of these 35 were followed-up six months after an outpatient rehabilitation program. By that time 55% had returned to work. Long sickness absence before the program began correlated with a lesser probability of returning to work.

Gottlieb et al. (6) studied the effects of a treatment program using self-regulated methods such as biofeedback and family therapy. Seventy-two patients with chronic low back pain were included, and 70% were reported as successfully rehabilitated. One month after the rehabilitation period 40 were again studied and 38 of these were in some kind of work.

Åberg (16) studied the results of rehabilitation in a back rehabilitation institute in Sweden. The institute gives vocational rehabilitation to subjects with chronic low back pain as well as treatment. The rehabilitation and treatment process takes place over six weeks when the subjects are in-house. Åberg's patients ($n=353$) had been off work for at least 1 year. About half of the population ($n=164$) were randomized to the institute treatment, while the others constituted the control group ($n=189$). One year later there was no difference between the groups in terms of return to work. For 15% of the proband group and 9% of the control group, one or more vocational factors had changed for the better.

The effect of a rehabilitation program in chronic low back pain is thus not thoroughly evaluated and may be of different outcome. It is therefore important to try to determine which patients would be amenable to rehabilitation, before they are placed in an often rather expensive treatment program.

The purpose of this study was to determine if certain clinical and social factors could be identified as predictors of the outcome of a rehabilitation process, measured in terms of return to work.

PATIENTS AND METHODS

The study was based on 52 patients, 35 men and 17 women. They were consecutively chosen from patients referred to the Department of Orthopaedic Surgery, Göteborg, Sweden, based on the following criteria:

1. Sick-listing because of chronic low back pain for at least 3 months.
2. Age less than 50 years.
3. Absence of neurological disturbances.
4. Good linguistic comprehension of Swedish.
5. Absence of other diseases preventing return to work.

The mean age was 41 years for the 35 men (range 27–49 years), and 38 years for the 17 women (range 29–48 years).

Every patient was carefully informed about the study and personally interviewed and examined by the author. The patient history was recorded on a standardized form and the physical examination followed a standardized protocol. Patients fulfilling the criteria were referred to the Rehabilitation Department.

In the Rehabilitation Department the patients were examined by the rehabilitation physician, psychologist, physiotherapist and generally also by the social worker and occupational therapist, whereafter treatment commenced.

The treatment program in the rehabilitation unit was based on this investigation and was individually adjusted. The patients' physical and psychological capacities or particular talents were thoroughly explored. They were

then to provide a basis for vocational training, psychological counselling and later for finding a suitable job.

The medical history included current and previous back problems, musculoskeletal disease and injury in general, other disease, and overall health. Daily activities were also evaluated, as well as previous and present work activities. Pain and function were the most important factors analyzed.

Standardized physical examination methods were used. Weight (in underwear) was measured in kilograms, height (without shoes) in centimetres. Postural abnormalities were noted, as well as increased tonus of paravertebral muscles. Spine motion in each plane was determined by observation and recorded as not restricted, mildly restricted, moderately restricted, and restricted. Leg length was measured from the superior anterior iliac spine to the medial malleolus and then checked out with foot plates. Straight leg raising (SLR) was considered positive when pain occurred in the back and leg and the range of motion was limited. Sensory function was evaluated for touch and pain, as well as ability to distinguish sharp and blunt. The gastrocnemius and quadriceps reflexes were compared bilaterally, as were the triceps, biceps, and brachioradialis reflexes. Weakness and atrophy of the leg muscles were noted with particular interest in the extensor hallucis longus and dorsal flexors of the foot. The Babinski's sign was also elicited.

Records from the National Health Insurance Office in Göteborg were obtained for all subjects from 1967 through 1976. Diagnoses and sickness absence periods were recorded and categorized as: 1–7 days absence, 8–30 days, and more than 30 days. Absence because of childbirth and care of sick children were excluded.

Social factors were analyzed using the social registry in Göteborg. In selected cases the files were studied with particular attention to child-care, social care and temperance care. Information about criminal acts was obtained from the central police registry.

The patients were followed-up one year after the rehabilitation began, using the same questionnaires and method of clinical examination. Data on sickness absence and health care utilization in the one-year period were also obtained. One patient refused participation at the follow-up, and another filled out the questionnaire but refused the physical examination.

Patients were grouped as working and non-working, the working group was defined as subjects working full time or part time as well as subjects in vocational training (not sick-listed), subjects temporarily out of work but not sick-listed, and subjects temporarily sick-listed but otherwise working. This is the standard definition used in the Department of Rehabilitation Medicine in Göteborg, to separate those capable of work from those not capable. A subgroup consisted of subjects working full time. The sick-group were those still sick-listed or receiving disability pension.

A second follow-up was made two years after the rehabilitation began. By this time sickness-absence was determined through the National Health Insurance System.

All data were analyzed at the University of Göteborg Computer Center. Results are given as direct comparison of mean values in the work-group and sick-group. Fisher's

Table I. Sickness absence due to Low Back Pain at the start of the study, subdivided into work-group and sick-group

The work- and sick-grouping is based on the 1-year follow-up

Months	All subjects (N)	Work-group (N)	Sick-group (N)
3-6	26	18	8
7-12	15	9	6
>12	11	4	7
Total	52	31	21

permutation test was used to test differences between groups (9). Two-sided p -values <0.05 were considered statistically significant.

PATIENTS—CLINICAL AND SOCIAL FACTORS

Clinical history

About one-fourth of the patients had had pain for 3-6 months, one-fourth from 7-12 months and the remainder for more than 1 year. More than 50% had had back-problems for five years or longer. Sickness absence due to LBP is reported in Table I. Half of the patients had been off work for 3-6 months, the remaining for 6 months or longer.

Nineteen patients (37%) said their pain began after a specific injury, while among the remaining 33, pain had developed gradually in 24 and acutely in nine but without any known predisposing injury. Twenty-nine patients thought that lifting was the cause of their pain. Pain was localized to the low back only in 12%, while the whole of one leg was involved in 50%. Most patients had pain and considered pain to be severe (Table II). Paresthesias were common, as was pain on coughing and sneezing (67%). More than half of the patients said that they had pain day and night, and that night sleep was disturbed.

Pain was usually described as "severe, dull pain", but "tiredness in lower back" and "stiffness" were also common verbal descriptions, as was "intense pain". Most patients used analgesics (Table III), ten used sedatives. The functional activities of daily life were reported to be restricted to some degree by most of the patients (Table IV). Pain in the neck and thoracic region was quite common as illustrated in Table V.

Physical examination

Sixty per cent of the patients had a normal range of motion of the lumbar spine. Two patients had restricted motion in the thoracic, and four in the cervical spine. About 75 per cent of the patients had pain on flexion and extension of the back, 59 per cent on lateral bending, and 50 per cent on rotation. Forty per cent had a positive SLR (Table VI). Postural abnormalities were present in 39% of

Table II. The patients' response to questions concerning low back pain

The work- and sick-grouping is based on the 1-year follow-up

	All (N=52)	Work-group (N=31)	Sick-group (N=21)
<i>Do back pain influence your work capacity?</i>			
Not much	0	0	0
Sometimes	4	2	2
Not important, I can't do some moments	20	11	9
Tough, I have difficulties in managing my work	28	18	10
<i>Do you have pain in the back when you cough, sneeze or strain?</i>			
No	17	13	4
Yes, for the present time	21	9	12
Previously, but not currently	14	9	5
<i>When do you have pain?</i>			
Not always, periodically, without strain	5	2	3
Not always, mostly when in strain (lifting, bending)	9	7	2
Always pain during the day, but not during the night	10	5	5
Always pain, day and night	22	13	9
Always pain, day and night, worse during the night	6	4	2
<i>For how long time have you been in bed the last month because of back pain?</i>			
0 days	11	8	3
1-5 days	19	11	8
More than 5 days	22	12	10

the patients, but were always minor (Table VII). Cutaneous sensibility was normal, and there were no asymmetries in reflexes or motor function. Babinski's sign was normal.

Table III. The patients' response to the question "Do you require pain medication?"

Response	All (N)	Work-group (N)	Sick-group (N)
No, never	2	2	0
Yes, rarely	9	8	1
Yes, but not daily	10	7	3
Yes, daily	11	7	4
Yes, day and night	12	3	9
I need, but do not want to use	8	4	4
Total	52	31	21

Table IV. Reported physical function at the start of the study

The work- and sick-grouping is based on the 1-year follow-up

	All (N=52)	Work-group (N=31)	Sick-group (N=21)
Can you lift?			
No	9	5	4
Yes, up to 5 kg	17	8	9
Yes, up to 10 kg	10	8	2
Yes, more than 10 kg	16	10	6
Can you bend forward?			
No	4	1	3
Yes, a little	22	13	9
Yes, but not completely	19	12	7
Yes	7	5	2
Do you have difficulties in managing ADL?			
No	8	6	2
Yes, but I can manage myself	32	21	11
Yes, I often need help	12	4	8

The patients' report about their functional capacity. The first part of the table represents 40 patients, the second part represents 12 patients. W = work-group, S = sick-group

	No difficulties		With some pain		Cannot		Do not know/ not answered	
	W	S	W	S	W	S	W	S
Walk	6	5	13	11	2	2	1	0
Walk in stairs	6	2	13	15	2	1	1	0
Run	1	1	6	3	11	13	4	1
Bend forward over wash-basin	4	1	13	11	4	6	1	0
Carry a bag	4	0	13	11	2	6	3	1
Make a bed	2	1	10	10	4	7	5	1
Drive a car	5	2	10	6	1	2	6	8
Sport activities	0	0	1	1	15	13	6	4
Vacuum-clean	2	1	6	8	5	8	9	1
Wash a car	2	0	4	3	4	7	12	8
Sit a longer period	1	1	13	9	6	8	2	0
For how long time can you do this without getting back pain?	More than 1 h		Less than 1 h		Cannot		Do not know	
	W	S	W	S	W	S	W	S
Stand	3	1	6	2	0	0	0	0
Sit	2	0	7	2	0	1	0	0
Daily housework	2	0	5	1	0	0	2	2
Sporting	2	0	0	0	1	1	6	2
Work in the garden	0	0	0	0	1	1	8	2
Travel by car	3	1	6	0	0	1	0	1
How long can you walk?	More than 5 km		1-5 km		Less than 5 km			
	W	S	W	S	W	S		
	6	1	2	2	1	0		

Previous treatment of LBP

Radiographs had been taken of all subjects. Only two showed structural abnormalities, both minor anterior wedging of vertebral bodies. Eight patients had had myelograms—all of which were normal. None of the patients had had spine surgery. All patients had been given conservative treatment, including physiotherapy and shortwave,

traction, corsets, chiropractic treatment, acupuncture and naprapathic treatment.

Sickness absence

The data for sick-leave up to 1977 are given in Table VIII. An average absence of 520 days was noted over the 10 year period with large variations. Seventy-two per cent of

Table V. Patients' response to the question "Have you had pain in the neck? Have you had pain in the dorsal spine (thoracic spine)?"

The work- and sick-grouping is based on the 1-year follow-up

	All (N)	Work-group (N)	Sick-group (N)
<i>Neck pain</i>			
No, never	19	16	3
Yes, on and off	24	11	13
Yes, always	2	1	1
Yes previously but not currently	7	3	4
Total	52	31	21
<i>Thoracic pain</i>			
No, never	39	27	12
Yes, on and off	10	3	7
Yes, always	1	1	0
Yes, previously but not currently	2	0	2
Total	52	31	21

the patients had been sick-listed because of ulcer/gastritis, 50% for psychiatric reasons.

Work situation

Most of the men were blue-collar workers, while most of the women were in health care or other service professions. Forty-three (83%) were employed as subordinates, six were supervisors, and three were in business of their own. The most frequent work posture was standing, and most subjects had jobs requiring bending and lifting (Table IX). Twenty-three patients (44%) lifted 20 kg or more at least once per hour. Only two patients were dissatisfied with their work, but 50% said they would prefer a different job. Two patients said that the work environment was poor.

Social factors

Most patients (71%) were married or living together with someone. Thirty (58%) had children 15 years or younger,

Table VI. Straight leg raising (SLR) at the start of the study

The work- and sick-grouping is based on the 1-year follow-up

SLR	All (N=52)	Work-group (N=31)	Sick-group (N=21)
Positive unilaterally	10	7	3
Positive bilaterally	11	7	4
Positive ≤ 60 degrees	7	5	2

Table VII. Observations made at the clinical physical examination

The work- and sick-grouping is based on the 1-year follow-up

Observation	All (N=52)	Work-group (N=31)	Sick-group (N=21)
<i>Lumbar spine</i>			
Flattening of lordosis	12	8	4
Hyperlordosis	6	3	3
Scoliosis	2	0	2
Muscle contracture	2	2	0
Pain on palpation of spinous process	15	9	6
Asymmetry of iliac crest	2	2	0
<i>Lower extremities</i>			
Deformities	2	1	1
Venous insufficiency	5	2	3
Pes planus	7	6	1
Hallux valgus	0	0	0
Claw toe	0	0	0
Leg length discrepancy	5	4	1
Calf atrophy	1	0	1
Reduced hip motion	0	0	0
<i>Thoracic spine</i>			
Scoliosis	1	1	0
Pain on palpation of spinous process	2	1	1
<i>Cervical spine</i>			
	0	0	0
<i>Upper extremities</i>			
Pain on palpation over lateral humerus-epicondyle	2	1	1

and of these five women and one man were single parents. Fifteen patients, eight men and seven women, were divorced. Four of them had a new permanent relationship.

Thirty-one patients (60%) had a registration at the Social Welfare office, usually under more than one heading; 27 for social care in general, 14 for care of their children and 14 for temperance care. Six men and one woman were recorded in the central police registry.

Family related problems were common, as were stressful life situations in general. All the 15 divorces involved alcohol and psychiatric problems.

Eighteen patients (35%) were out of work, and another two were in a temporary work situation. Thirty-one patients were smokers, 17 consumed at least 15 g alcohol per day, and 27 were overweight (BMI>25).

RESULTS

In the one year follow-up study there were 31 subjects (60%) in the working group, 21 (40%) in the sick-listed group. Twelve (23%) of those "working" were in full-time employment, ten worked

Table VIII. Previous sickness absence (1967-1976)

The work- and sick-grouping is based on the 1-year follow-up

Sickness absence	Work-group (N=29)	Sick-group (N=17)	Total (N=46)
Sick-days total			
Mean	522	516	520
SD	397	532	419
Range	37-1 586	77-2 352	37-2 352
Sick-days back diagnoses			
Mean	168	86	138
SD	260	107	216
Range	0-1 219	0-322	0-1 219
Sickness absence episodes <7 days			
Mean	17.8	15.4	16.9
SD	10.5	9.5	10.0
Range	2-4	2-31	2-44
Sickness absence episodes 8-30 days			
Mean	7.9	8.5	8.1
SD	6.4	4.9	6.0
Range	1-29	1-18	1-29
Sickness absence episodes >30 days			
Mean	4.0	3.8	4.0
SD	2.9	3.7	3.2
Range	0-11	0-15	0-15

Table IX. Work factors

The work- and sick-grouping is based on the 1-year follow-up

	All (N=52)	Work-group (N=31)	Sick-group (N=21)
<i>Do you have to lift during the workday?</i>			
Often (5 kg or more at least 10 times/h)	28	17	11
Sometimes (5 kg or more sometimes, but less than 10 times/h)	18	12	6
Rarely or never (occasional lifts accepted)	6	2	4
<i>Do you have to twist the body during work?</i>			
Often (more than 10 times per work hour)	46	27	19
Seldom (less than 10 times per work hour but not regularly)	5	3	2
Never or seldom	1	1	0
<i>Do you bend forwards during the workday?</i>			
Often (more than 10 times per work hour)	38	24	14
Sometimes (less than 10 times per work hour, but regularly)	12	5	7
Seldom or never	2	2	0

half-time, four were in full-time vocational training, three were temporarily out of work but not sick-listed, and two were temporarily sick-listed.

A number of variables in the patient's history and physical examination had changed over the one year period. Pain and function were generally improved (Table X-XI). There were few changes in the clinical status. Straight leg raising (SLR) was improved so that at one year there were only six positive, compared to 21 at the first examination. There was no difference between the working-group and the sick-listed group in health care utilization over the year.

A few factors were found to have prognostic value with respect to return to work (Table XII). While not statistically significant, more pain indicated a greater chance of no returning to work. Previous pain in the cervical and thoracic spine ($p<0.05$) was associated with a statistically significantly greater risk of still being sick-listed at one year. High consumption of analgesics was a negative factor ($p<0.001$). The sickness absence period before rehabilitation had no significant importance

in the group as a whole. When dividing the group into those younger and those older than the median age, however, a significant association was found in the older group; long sickness absence was negative with respect to work return ($p<0.01$). Fatigue at the end of the work-day was negative with respect to return to work ($p<0.05$). The patients' attitude to his own ADL capacity was generally not of significant predictive value for return to work for the whole group in comparison with the sick-group.

No observations from the physical examination were of significant importance with respect to return to work, nor were any of the social factors, such as marital status, family situation, Social welfare office registration, criminality, income, life problems, or smoking and alcohol habits. Previous sickness absence, previous treatments and evaluation for back pain, and the patients' general medical history were other factors without prognostic value, and work factors did not influence the prognosis.

To further evaluate the importance of different variables, an analysis was made where patients

Table X. The patients' response to pain questions, at the start of the study and after 1 year

	At the start	After 1 year
<i>When do you have pain?</i>		
Work-group (N=30)		
Not always	8	18
Always	22	12 $p<0.05$
Sick-group (N=21)		
Not always	5	7 NS
Always	16	14
<i>Do you require pain medication?</i>		
	N=52	N=46
No, never	2	6
Yes, rarely	9	8
Yes, but not daily	10	10
Yes, daily	11	11
Yes, day and night	12	8
I need, but do not want to use	8	3
<i>Do you have pain in the back when you cough, sneeze or strain?</i>		
	N=52	N=51
No	17	25
Yes, for the present time	21	15
Previously, but not currently	14	11
<i>Does the pain prevent you from falling asleep?</i>		
	N=52	N=51
Never	3	9
Sometimes	19	18
Often	30	24
<i>Do you awake because of the pain during the night?</i>		
	N=52	N=51
Never	6	26
Sometimes	19	24
Often	27	1

who returned to *full-time work* were compared to those who were sick-listed. As appears from Table XIII, sex, the length of time of sick-listing, analgesic drug consumption, the patients' attitude to his own ADL capacity, and pain in neck and dorsal spine were all of significant value.

DISCUSSION

The purpose of this study was to determine if factors in a patient's clinical and social situation affected significantly his or her returning to work after rehabilitation. We hoped to identify factors that would suggest better allocation of rehabilitation resources. An ideal study would have included all patients in the area who met the inclusion criteria. These patients would then have been randomized to a rehabilitation group and a perfectly matched

Table XI. The patients' response to questions about their physical function, at the start of the study and after 1 year

	At the start	After 1 year
<i>Do you have difficulties in managing activities of daily life?</i>		
Work-group (N=30)		
No	6	16
Yes, no help required	20	13 $p<0.01$
Yes, help required	4	1
Sick-group (N=21)		
No	2	2
Yes, no help required	11	16 NS
Yes, help required	8	3
<i>Can you lift?</i>		
	N=52	N=51
No	9	7
I can, but no more than 5 kg	17	17
I can, but no more than 10 kg	10	7
I can, lift more than 10 kg	16	20
<i>Can you bend forwards?</i>		
	N=52	N=51
No	4	2
Yes, a little	22	14
Yes, but not fully	19	24
Yes	7	11

control group: treatment would have been kept constant and the groups again examined, using a single blind technique. We realized early that it was not realistic to include all local area patients with chronic low back pain. We also felt that it was difficult to control treatment and intervention in a control group, fully aware of the many therapeutic modalities that these patients seek. Finally, the study did not aim at investigating the efficiency of a certain rehabilitation program. Therefore, we invited certain physicians to send patients and accepted

Table XII. Significant differences between the work-group (N=31) and the sick-group (N=21)

Duration of sick-leave (only in patients older than median age, it was a negative correlation between time on sick-leave and frequency of returning to work)	$p<0.01$
Reported need for analgesics (the working group reported less need of analgesics)	$p<0.001$
Reported history of pain in the cervical and dorsal areas of the spine as well as in the lumbar region (less frequent in the working group)	$p<0.05$
Reported fatigue at the end of the work day (less frequent in the working group)	$p<0.05$

Table XIII. Significant differences between patients returning to full time work ($n=12$) and the sick-leave group ($N=21$)

Sex (only men returned to full time work)	$p<0.01$
Duration of sick-leave (it was a negative correlation between time on sick-leave and frequency of returning to work)	$p<0.05$
Reported history of pain in the cervical and dorsal area of the spine as well as in the lumbar region (less frequent in the working group)	$p<0.05$
Reported need for analgesics (the working group reported less need of analgesics)	$p<0.001$
The patients' attitude to his own ADL-capacity (those who returned to work were more positive)	$p<0.05$

all those who met the inclusion criteria. We also decided to perform the study in the existing health and hospital organizational model and to accept the patients as their own controls. One reason for this study model was the realistic situation regarding the time aspect, the costs and the system of general regulations. We hoped to obtain at least some data on which prospective studies could be based.

The design of this study does not permit generalization. Although we do not know how well the study population represents the total population with chronic low back pain, we were careful not to select within the remitted patient population and to inform the remitting physicians not to do any selection. There was no significant difference between patients remitted from the Orthopedic Department (31) and those who came from other physicians (21), with respect to either age, sex, age when the back problem began, total duration of the back problem, sickness period, previous work situation, pain perception, and functional status. There were, however, significant differences in social bureau registration, where patients from the Orthopedic Departments were found to have more registrations than those referred from other physicians. The variable did not significantly influence the prognosis, however.

The inclusion criteria were chosen to give an as homogeneous group of patients as possible. Three months was chosen as a minimal time period for chronic pain, but in fact three-quarters of the patients had been off work for more than 6 months, and about half for more than 1 year. The age criteria were chosen so that age would not be a factor of importance in the vocational rehabilitation. Profi-

ciency in Swedish was necessary to complete the psychological examination which took place along with the one reported here (Esbjörnsson, 1984).

There was no social or economic factor in the inclusion criteria. It was found, however, that the population was socio-economically quite homogeneous. However, social insufficiency was common which is consistent with the findings of Westrin (1970) in his controlled study of low back pain patients in the same area.

Determination of the symptoms, the pain perception and the functional ability is always difficult in patients with low back pain (Westrin, 1970; Svensson, 1981; Biering-Sørensen, 1984). In this study symptomatic definitions were used, all forms were standardized, and all interviews were made by the same person.

Few clinical and social factors were found to discriminate among those who did return to work and those who did not. Social factors were found to be of little importance. Pain was an indicator, but only statistically significant in terms of use of analgesics.

Another predictor was fatigue at the end of the work-day. Other work-related factors did not discriminate. Svensson (1981) found that fatigue at the end of the work-day was significantly more frequent among subjects with back pain than among subjects without. Apparently there is a difference also among subjects with back pain. Perhaps it is an indicator of severity or it may be a sign of neuroasthenia (14), or of a "lifestyle of invalidism" (10).

Back pain was rather often present in several areas of the spine in this group. In the present study those patients with these symptoms were found to have a worse prognosis. Again, it is maybe an indicator of severity. Chronic pain patients typically complain of pain in several locations (3). Another possibility, therefore, is that it is an indicator of a different pain response.

The fact that only men returned to full time work may be explained by the sex role in Sweden. These men had more positive self-concepts than the members of the sick-group. A short period of sick-listing was a positive factor concerning the prognosis for return to full time work. This is consistent with the findings of Beals & Hickman (1). One explanation is that a longer leave of absence weakens the work identity (how the individual is related to colleagues, and his self-image as a working man). Adaptation to non-working can be expected with time.

We found no direct relationship between physical examination results and probability of returning to work. This suggests that in chronic LBP patients in whom neurologic and structural changes are not present, a further standard clinical evaluation should not be used to preselect patients to a rehabilitation program.

CONCLUSION

Only a few clinical, and no social factors studied, predicted return to full time work after a rehabilitation program. Preselection must be based on other factors. The results of this study suggest that among the relevant factors are

(a) the length of the sickness absence period (a negative correlation between time on sick-leave and frequency of return to work),

(b) sex (a more positive prognosis for men than women for return to full-time work),

(c) need for analgesics (a lesser need indicates a greater chance for returning to work),

(d) the patient's attitude to his own ADL capacity (a more positive attitude indicates a growing possibility for returning to work),

(e) pain in the cervical and dorsal areas of the spine as well as in the lumbar region (a negative correlation between pain in other areas of the spine as well as in the lumbar region and the frequency of return to work).

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