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Predictors and Modifiers of Treatment Effect Influencing Sick Leave in Subacute Low Back Pain Patients

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Study Design. Modifying effects in multivariate analyses of a randomized controlled trial.

Objectives. To identify prognostic factors for the effect of a brief intervention ("modifiers") at a spine clinic on return to work in patients with subacute low back pain.

Summary of Background Data. A previous study of a brief intervention showed significant reduction of sick leave, compared with usual primary healthcare treatment. Randomized controlled trials give data only on the group as an average. Identifying prognostic factors that interact with the treatment ("modifiers") may identify specific groups requiring this or other types of treatment.

Methods. A total of 457 patients who had been sick-listed 8 to 12 weeks for low back pain were randomized into an intervention group (spine clinic with medical examination, information, reassurance, encouragement to engage in physical activity, n = 237), and a control group (primary health care, n = 220). All subjects filled out questionnaires. Logistic regression and tests for interaction were used to identify prognostic factors and modifiers for return to work in the two groups, at 3 and 12 months of follow-up.

Results. At 3 months of follow-up, the strongest modifying effect on return to work was the perception of constant back strain when working and beliefs about reduced ability to work. At 12 months, gastrointestinal complaints were the strongest modifier for the effect of the intervention.

Conclusion. The spine clinic intervention seems to have a main effect on work absenteeism *via* interacting with the concerns of being unable to work.

Key words: subacute low back pain, predictive factors, randomized controlled study, return to work, subgroup, modifier. **Spine 2005;30:2717–2723**

In Norway, low back pain (LBP) accounts for 14% to 15% of all sickness compensations lasting longer than 2 weeks and of all disability benefits.[1] Most often, LBP is a benign and self-limiting condition. Most patients on sick leave due to LBP return to work within the first year.[2] However, some patients develop chronic LBP. Patients at highest risk for future LBP disability pension perceive their work as physically demanding. They report poor general health and feel generally tired and worn out.[3] They have high Oswestry scores at entry and low expectations of treatment.[4] Other important variables for future disability are older age, high pain intensity, and low self-assessed work ability.[5,6] Duration of sick leave is another main determinant of not returning to work.[4,7–9]

The most important and consistent predictors of chronic disability in patients with acute LBP are the psychosocial variables.[10–13] Physically demanding work has also been reported to be a risk factor for a prolonged period on Worker Compensation benefits.[6,14,15] However, a study by Lindstrom *et al* showed that sick leave was not predicted by work postures or the compression load on the spine.[16] Patients' beliefs and coping behaviors play central roles in their adjustment to chronic pain.[17,18] Numerous studies of patients with a wide variety of chronic pain problems have shown that patients' beliefs about their pain (*e.g.*, belief that one can control one's pain, belief that one is disabled by pain) and the strategies they use to cope with their pain are associated with measures of pain intensity as well as psychosocial and physical functioning.[19–21] Changes in the pain components (cognitive, subjective, behavioral, depression, anxiety) occur during the first 3 months with pain.[22] Fear of pain and avoidance behaviors are present in patients with acute LBP and may be important factors in explaining the transition from acute to chronic conditions.[23,24] An avoidance response may lead to a reduction in physical and social activities, an exacerbation of the fear and avoidance behaviors, prolonged disability, and adverse physical and psychologic consequences.[25–27]

Systematic literature reviews of randomized controlled trials[28] provide evidence that intensive multidisciplinary biopsychosocial rehabilitation with functional restoration reduces pain and improves function in patients with chronic LBP. However, for patients with subacute LBP brief and simple interventions[29–33] have shown significant reductions in days of sickness compensation.

Randomized controlled trials, albeit the golden standard for evaluation of treatment efficacy, only give data on the group average. The predictive value of the prognostic factors is limited, probably because so many prognostic factors interact with treatment and treatment outcomes. For a light mobilization program similar to what we used, only combined models (medical, psychological, and social) had acceptable predictive power (77%; dis-

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criminant analyses) for those not returning to work within 12 months.[34] Identification of the prognostic factors that interfere with the treatment may, therefore, improve treatment of low back pain,[33] and interaction tests are regarded as the most efficient method for these problems.[33,35]

■ Materials and Methods

A total of 457 patients sick-listed 8 to 12 weeks for LBP with or without radiating pain and age between 18 and 60 years were included in the study and randomized into two groups: an intervention group/spine clinic group (n = 237), and a control group/primary healthcare group (n = 220). Mean age at entry was 41 years: 52% men and 48% women. Exclusion criteria were pregnancy, recent low back trauma, cauda equina symptoms, cancer, osteoporosis, rheumatic low back disease, and ongoing treatment for LBP by another specialist. Patients were randomized using concealed randomization procedures.[31,32]

Patients in the control group were invited to their local insurance office within the 12th week of sick leave to answer the same questionnaires as in the intervention group. They were not examined at the spine clinic but were treated within the primary health care. The patients in the intervention group were invited to the spine clinic within the 12th week of sick leave. They were interviewed and examined by a team consisting of a physician (specialist in physical medicine and rehabilitation) and a physiotherapist. Special attention was given to the description of daily activities and the restrictions caused by LBP, in addition to psychosocial conditions at home and at work. Unless symptoms and clinical findings indicated any serious spinal disease, the patients were informed about the good prognosis and the importance of staying active to avoid development of muscle dysfunction. They were encouraged to do daily walks. All the patients were advised and instructed individually by the physiotherapist in how to train and stretch at home and received practical advice in coping with daily activities at home and at work, and how to resume normal activities. The patients were encouraged to contact the spine clinic whenever they wanted.

Data on sick leave (total length of leave and frequency), disability, and other social benefits were collected register data from the National Insurance Offices. Data from 2 patients in the intervention group (1 man and 1 woman) were missing at 2 years of follow-up. At 3 years of follow-up, data were missing from 11 patients (4 men and 7 women) in the intervention group and 5 patients (2 men and 3 women) in the control group.

Questionnaires. At inclusion time 8 to 12 weeks after sick leave, all patients in the intervention group and the control group answered standard validated Norwegian versions of questionnaires regarding psychosocial and sociodemographic data. Only data that are analyzed are presented here; gender, age, years of education, lifestyle (physical activity, alcohol, coffee, and smoking), belief in recovery, other illnesses, if they previously had been sick-listed for LBP, and other standardized questionnaires described below. Follow-up questionnaires were sent to the patients 6, 12, and 24 months after sick leave.

Job security was measured by the question; "Do you have a job to return to?"

Perceived physical workload was measured by four questions about the frequency work involved repetitive movements, positions with constant strain on the back, hands above shoulder heights, and lifting more than 20 kg (alpha = 0.57).

Psychological work load was measured by a Norwegian version of the Cooper job stress questionnaire.[36,37] The scale consists of 22 items rated on a 6-point scale ranging from 0 (no stress) to 5 (high experience of stress). One of the subscales (job stress) was analyzed here. This scale consists of 3 items: amount of work, time pressure and work-life imbalance (alpha = 0.71).

Subjective health complaints were measured by 29 items from the Subjective Health Complaint Inventory.[38] Subjective somatic and psychologic complaints experienced during the last 30 days were measured. Severity was scored on a 4-point scale. The Subjective Health Complaint Inventory yields five subscales; three of them are analyzed in this material: musculoskeletal pain (alpha = 0.67), "pseudoneurology" (palpitation, heat flushes, sleep problems, tiredness, dizziness, anxiety, and depression), (alpha = 0.72), and gastrointestinal complaints (alpha = 0.64).

Perceived work ability was measured by the Graded Reduced Work Ability Scale[34] and consists of six items grading the self-reported working capacity of the patient in relation to the complaints for which they were sick listed (alpha = 0.73). Three of these items (reduced ability to work, the belief work will aggravate condition, and other complaints) are analyzed here.

Health locus of control was measured by 18 items from the Multidimensional Health Locus of Control questionnaire (Form A),[39,40] scored on a 6-point scale (alpha = 0.74). The Multidimensional Health Locus of Control consists of three subscales: internality, or the extent to which the respondent believes that power to affect his state of health lies within his own control (alpha = 0.70), chance (alpha = 0.59), and powerful others (alpha = 0.67).

The Activity Discomfort Scale[41] measures the amount of pain caused by each of 18 common daily activities, such as walking, bending, sitting, standing, driving, and the like (alpha = 0.89).

State and Trait Anxiety were measured by 20 items, scored on a 4-point scale, from the State-Trait Anxiety Inventory.[42] The questionnaire yields two subscales: state anxiety (alpha = 0.83) and trait anxiety (alpha = 0.84). State anxiety may fluctuate over time and can vary in intensity. Trait anxiety is stable individual differences and refers to a general tendency to respond with anxiety to perceived threats in the environment.

Coping and defense were measured by the CODE.[43] CODE consists of the Utrecht Coping List[44] and a reduced Defense Mechanism Inventory,[45] and measures four subscales. Only instrumental mastery-oriented coping (alpha = 0.74) is analyzed here.

Statistical Analyses. SPSS 12.0 was used for all analyses. SPSS 12.0 was used for all analyses. The data for the intervention group (n = 237) and the control group (n = 220) were split into the patients who had returned to work and those who had not 3 and 12 months after consultation. Returners and nonreturners were compared at baseline to decide which variables had predictive value for the outcome for each of the two groups.

All variables were dichotomized using the median score as the split point. The exception is belief in recovery where the variables were divided between "to a small extent" and "some and large extent." In Phase 1, all potential predictors were tested with logistic regression. To test for potential modifiers in

the two subgroups, we added the interaction.[35] Return *versus* non-return after 3 and 12 months was the dependent variable. Statistical significance was defined as $P < 0.05$. In Phase 2, all significant variables were included in a multiple logistic regression model where gender, age, education, and group were used as control variables. The variables were then entered into the model, one by one, starting with the most significant variables. If $P < 0.20$, the variables were included in further analysis.

■ Results

There were no significant differences between the intervention group and the control group on baseline characteristics.[31] At 3 months of follow-up, 52% of the patients in the intervention group had returned to full-duty work, as compared with 36% in the control group (relative risk = 1.45). At 1-year follow-up, 68% in the intervention group had returned to work compared with 56% in the control group (relative risk = 1.21).[31] At 3 years of follow-up, there were no significant differences between the groups.[32]

Analysis in Phase 1 showed 14 significant predictors and 4 interaction effects for the 3-month follow-up. For the 1-year follow-up, there were 13 significant predictors and 2 interaction effects (Tables 1–3). These were included in a multiple regression model (Tables 4, 5).

Predictors for Non-Return to Work After 3-Month Follow-up

Other illnesses (odds ratio [OR] = 3.1; 95% confidence interval [CI] = 1.3–7.2), the belief that work would aggravate the condition (OR = 2.3; 95% CI = 1.3–3.9), pain when performing daily activities (OR = 2.1; 95% CI = 1.3–3.6) and age below 41 (OR = 0.6; 95% CI = 0.3–1.0), were significant predictors for non-return, both subgroups (intervention and control group) combined (Table 4).

Treatment Modifiers: 3-Month Follow-up

The multiple regression showed that there was a significant interaction effect for three of the variables. Of those patients reporting work with constant back strain more than 50% of the working time, 65% of the patients in the control group, and 36% of the intervention group were sick-listed at the 3-month follow-up (OR = 3.7; 95% CI = 1.3–10.7) (Figure 1). Of those patients that believed their ability to work was largely reduced, 76% of the patients in the control group and 55% of the patients in the intervention group were sick-listed at 3 months of follow-up (OR = 2.8; 95% CI = 1.0–7.6). Among patients that scored low on chance (health locus of control), 72% of the patients in the control group and 45% of the patients in the intervention group were sick listed at 3 months of follow-up (OR = 0.2; 95% CI = 0.1–0.7) (Tables 3, 4; Figure 1).

Predictors for Non-Return After 1-Year Follow-up

Other illnesses (OR = 2.4; 95% CI = 1.2–4.7), chance externality (health locus of control) (OR = 2.3; 95% CI = 1.2–4.7), less than 12 years of education (OR = 2.0; 95% CI = 1.0–3.9), low belief that their back pain would disappear (OR = 1.8; 95% CI = 1.0–3.3), and being a female (OR = 1.7; 95% CI = 1.0–2.7), were significant predictors for non-return, both subgroups (intervention and control group) combined (Table 5).

Table 1. OR for Potential Predictors for Non-Return (n = 252) *vs.* Return to Work (n = 205) After 3-Month Follow-up, All Patients (Intervention Group and Control Group) Included

Variables Studied (n = 457)	Non-Returners (n = 252) (%)	OR With 95% CI Adjusted for Group (intervention group and control group)	*P*
Control group (n = 220)	63	1.8* (1.3–2.6)	0.002
Female (48%)	55	1.0 (0.7–1.4)	0.894
Age >41 yr	51	0.7 (0.5–1.0)	0.039
<12 yr education (82%)	55	1.0 (0.6–1.6)	0.962
High psychologic workload (Cooper) (26%)	66	1.8 (1.2–2.9)	0.009
No job (8%) when off sick-list	70	2.0 (1.0–4.2)	0.063
Repetitive movements >50% of the working time (45%)	51	0.7 (0.5–1.1)	0.090
Constant back strain >50% of the working time (40%)†	49	0.7 (0.5–1.0)	0.049
Hands above shoulders >50% of the working time (75%)	56	1.1 (0.7–1.6)	0.810
Lift >20 kg 5 times a working day and more (50%)	53	0.9 (0.6–1.3)	0.590
Diagnoses LBP (59%) (others had sciatica)	55	1.0 (0.7–1.5)	0.990
Pain when performing daily activities	68	2.8 (1.9–4.2)	<0.001
Musculoskeletal pain	61	1.5 (1.0–2.2)	0.042
Pseudoneurology	63	1.8 (1.2–2.6)	0.004
Gastrointestinal problems†	61	1.4 (0.9–2.1)	0.105
State anxiety	63	1.9 (1.3–2.8)	0.001
Trait anxiety	59	1.4 (0.9–2.0)	0.130
Fingertip-floor distance more than 0 (56%) (measured in spine clinic only, n = 237)	52	1.4 (0.8–2.4)	0.183
Previously sick-listed for same complaints (70%)	56	1.2 (0.8–1.8)	0.351
Other illnesses (15%)	71	2.2 (1.2–3.8)	0.008
Other complaints that affect health (22%)	65	1.7 (1.0–2.7)	0.033
Very large reduced ability to regularly work (47%)†	67	2.3 (1.5–3.3)	<0.001
Believe work will aggravate condition (47%)	70	2.9 (2.0–4.4)	<0.001
Don't believe back pain will disappear (20%)	71	2.6 (1.4–3.8)	0.002
Low internality (health locus of control)	58	1.2 (0.8–1.7)	0.454
High chance externality (health locus of control)†	52	0.8 (0.5–1.2)	0.236
Powerful others (health locus of control)	59	1.3 (0.9–1.9)	0.204
Low instrumental coping	61	1.6 (1.1–2.3)	0.019
Smoking (55%)	59	0.7 (0.5–1.1)	0.103
No regularly physical exercise before sick-list (44%)	59	1.3 (0.9–2.0)	0.132

Note: Continues variables were dichotomized using the median split, unless otherwise specified.
*Nonadjusted.
†Has an interaction effect (see Table 3).

Table 2. OR for Potential Predictors for Non-Return (n = 168) *vs.* Return to Work (n = 289) After 1-Year Follow-up, All Patients (Intervention Group and Control Group) Included

Variables Studied (n = 457)	Non-Returners (n = 168) (%)	OR With 95% CI Adjusted for Group (intervention group and control group)	*P*
Control group (n = 220)	43	1.6* (1.1–2.4)	0.011
Female (48%)	40	1.3 (0.9–1.9)	0.201
Age >41 yr	39	1.2 (0.8–1.8)	0.292
<12 yr education (82%)	40	2.4 (1.3–4.2)	0.004
High psychologic workload (Cooper) (26%)	42	1.4 (0.9–2.2)	0.156
No job (8%) when off sick-list	51	1.9 (1.0–3.8)	0.059
Repetitive movements >50% of the working time (45%)	30	0.6 (0.4–0.8)	0.006
Constant back strain >50% of the working time (40%)	30	0.6 (0.4–1.0)	0.032
Hands above shoulders >50% of the working time (75%)	36	1.0 (0.6–1.6)	0.978
Lift >20 kg 5 times a working day and more (50%)	35	0.9 (0.6–1.3)	0.538
Diagnoses LBP (59%) (others had sciatica)	39	1.3 (0.9–1.9)	0.202
Pain when performing daily activities	43	1.7 (1.1–2.6)	0.009
Musculoskeletal pain	43	1.5 (1.0–2.2)	0.041
Pseudoneurology	43	1.6 (1.1–2.3)	0.023
Gastrointestinal problems†	40	1.2 (0.7–1.7)	0.481
State anxiety	40	1.4 (0.9–2.0)	0.130
Trait anxiety	41	1.5 (1.0–2.2)	0.062
Fingertip-floor distance more than 0 (56%) (measured in spine clinic only, n = 237)	31	1.0 (0.6–1.8)	0.992
Previously sick-listed for same complaints (70%)	39	1.6 (1.0–2.5)	0.034
Other illnesses (15%)	57	2.5 (1.5–4.1)	0.001
Other complaints that affect health (22%)	52	2.2 (1.4–3.4)	0.001
Very large reduced ability to regularly work (47%)	41	1.3 (0.9–1.9)	0.251
Believe work will aggravate condition (47%)	44	1.8 (1.2–2.7)	0.003
Don't believe back pain will disappear (20%)	53	2.3 (1.4–3.8)	0.001
Low internality (health locus of control)	38	0.9 (0.6–1.3)	0.556
High chance externality (health locus of control)†	38	1.3 (0.8–1.7)	0.548
Powerful others (health locus of control)	40	1.4 (0.9–2.1)	0.101
Low instrumental coping	40	1.5 (1.0–2.2)	0.047
Smoking (55%)	41	1.1 (0.7–1.6)	0.690
No regularly physical exercise before sick-list (44%)	36	1.4 (1.0–2.1)	0.086

Note: Continuous variables were dichotomized using the median split, unless otherwise specified.
*Nonadjusted.
†Has an interaction effect (see Table 3).

Treatment Modifiers: 1-Year Follow-up

A total of 55% of the patients in the control group and 22% of the intervention group were sick listed at 1 year of follow-up if they scored high on gastrointestinal complaints at baseline (OR = 3.3; 95% CI = 1.2–9.0). Scoring low on chance (health locus of control) elevated the probability of being sick listed at 1 year of follow-up for the patients in the control group, while the reversed effect was true for the intervention group (OR = 0.3; 95% CI = 0.1–0.8) (Tables 3, 5; Figure 1).

■ Discussion

The interaction analyses of the prognostic factors revealed that the patients with LBP that appeared to benefit most from treatment were those that initially believed that their ability to work was largely reduced, that their work was straining for the back, and that the reason for their health complaint was not attributed to chance. Much of the brief intervention is directed to these factors. A significant part of the difference in return to work between the intervention group and the control group is carried by these items in the interaction analyses. This suggests that the treatment may be particularly efficient in changing these attitudes that in themselves predict poor prognosis.

The interaction with a low score on the "chance" dimension of external locus of control of health is particularly interesting. Patients with a low score on this dimension do not believe that health problems are due to chance and luck. They believe that their main health problem is the back, and this problem is not related to chance, but to their work. Therefore, they have to avoid work in order to alleviate their problem. It is generally accepted that this type of belief is a particularly important factor for prolonged absence from work.[46] These attitudes are what our brief intervention is aiming at changing.

It is true that work postures and compression load on the spine have been shown to be predictors for prolonged sick leave for LBP.[3,6,13,14]. In our material, heavy lifting or perceived constant back strain did not predict long-term sick leave, which is in accordance to the findings by Lindstrom *et al*.[16] Our findings indicate that duration of sick leave may be more likely influenced by other illnesses and cognitive factors, a finding also noted by Waddell and Burton.[46] Cognitive factors are important in how the patients experience pain, how they cope with pain, and in the transition from acute to chronic pain.[18–21,23,24]

At the 1-year follow-up, the strongest modifying effect of treatment results was for patients with a high score on gastrointestinal complaints from the Subjective Health Complaints inventory.[38] This inventory records only subjective complaints. The gastrointestinal complaints may be a part of more generalized health complaints. In extreme degrees, this represents a somatization syndrome. A possible explanation for why this may modify treatment effect may be that, since the treatment focus on fear reduction for LBP, this may also change general beliefs about illness and complaints.

Table 3. Interaction Between Predictors and Subgroups

	3 Months				1 Year			
	% Non-Return Control Group	% Non-Return Intervention Group	OR* With 95% CI	Interaction Effect (*P*)	% Non-Return Control Group	% Non-Return Intervention Group	OR* With 95% CI	Interaction Effect (*P*)
Constant back strain <50% of the working time	62	56	1.3 (0.8–2.8)	0.019	44	37	1.4 (0.8–2.3)	
Constant back strain >50% of the working time	65	36	3.3 (1.8–6.2)		42	20	2.8 (1.4–5.4)	0.101
Low gastrointestinal problems	56	48	1.4 (0.8–2.2)		36	36	1.0 (0.6–1.7)	
High gastrointestinal problems	74	45	3.5 (1.8–6.7)	0.021	55	22	5.4 (2.2–8.7)	0.001
Little reduced ability to regularly work	47	44	1.1 (0.7–1.9)	0.033	37	31	1.3 (0.7–2.2)	
Large reduced ability to regularly work	76	55	2.6 (1.5–4.6)		48	32	2.0 (1.1–3.4)	0.285
Low chance externality	72	45	3.2 (1.7–5.6)	0.010	46	24	2.7 (1.5–4.8)	
High chance externality	54	51	1.1 (0.7–1.2)		39	36	1.1 (0.6–1.9)	0.031

*Odds for non-return *versus* return in the control group compared with the intervention group.

Strengths of our study are high participation rate, representative study subjects, simple study design, and treatment intervention that easily can be reproduced elsewhere. A total of 93% of the patients randomized to the intervention group and 86% of the patients randomized to the control group agreed to participate. Patients included in the study were referred from the whole county of Hedmark, and to our knowledge, there was no selection bias or other systematic differences in the referral pattern. Type of work in the study group was similar to employment in Hedmark County. Unemployment rate in Hedmark (2.9%) was comparable to the whole country (3.2%). Some of the patients in the control group might have been disappointed of not

Table 4. Multiple Logistic Regression With Non-Return After 3 Months as Dependent Variable and Gender, Age, Education, and Group (Intervention Group *vs.* Control Group) as Control Variables (n = 457, Both Intervention and Control Groups)

	Final Step	
	OR* (95% CI)	*P*
Control group	0.9 (0.3–2.7)	0.931
Female (48%)	1.2 (0.7–2.0)	0.539
Age >41 yr	0.6 (0.3–1.0)	0.034
<12 yr education (82%)	0.9 (0.5–1.6)	0.654
Large reduced ability to regularly work (47%)	0.8 (0.4–1.6)	0.789
Constant back strain >50% of the working time (40%)	0.5 (0.2–1.1)	0.072
Gastrointestinal problems	0.7 (0.3–1.5)	0.684
High chance externality	1.6 (0.8–3.2)	0.185
Believe work will aggravate condition (47%)	2.3 (1.3–3.9)	0.004
Pain when performing daily activities	2.1 (1.3–3.6)	0.007
Don't believe back pain will disappear (20%)	1.9 (1.0–3.9)	0.061
State anxiety	1.6 (0.9–2.6)	0.085
Other illnesses (15%)	3.1 (1.3–7.2)	0.009
Interaction; very large reduced ability to regularly work in the control group *versus* intervention group	2.8(1.0–7.6)	0.046
Interaction; frequent work with constant back strain in the control group *versus* intervention group	3.7 (1.3–10.7)	0.014
Interaction; high gastrointestinal problems in the control group *versus* intervention group	2.8 (0.9–8.3)	0.066
Interaction; high health locus of control "chance" in the control group *versus* intervention group	0.2 (0.1–0.7)	0.006
Nagelkerke R^2	0.331	

Note: Pseudoneurology, musculoskeletal pain, low instrumental coping, and "other complaints that affects health" did not reach $P < 0.20$ and were excluded from further analysis.
*Odds for non-return *versus* return.

Table 5. Multiple Logistic Regression With Non-Return After 1 Year as the Dependent Variable and Gender, Age, Education, and Group (Intervention Group *vs.* Control Group) as Control Variables (n = 457, Both Intervention and Control Groups)

	Final Step	
	OR* (95% CI)	*P*
Control group	2.0 (0.9–4.4)	0.097
Female (48%)	1.7 (1.0–2.7)	0.039
Age >41 yr	1.1 (0.7–1.8)	0.622
<12 yr education (82%)	2.0 (1.0–3.9)	0.040
Gastrointestinal problems	0.5 (0.2–1.0)	0.050
High chance externality	2.3 (1.2–4.7)	0.017
Other illnesses (15%)	2.4 (1.2–4.7)	0.009
Don't believe back pain will disappear (20%)	1.8 (1.0–3.3)	0.049
Believe work will aggravate condition (47%)	1.5 (1.0–2.5)	0.080
Previously sick-listed for same complaints (70%)	1.6 (0.9–2.8)	0.084
Interaction; high gastrointestinal problems in the control group versus intervention group	3.3 (1.2–9.0)	0.020
Interaction; high health locus of control "chance" in the control group versus intervention group	0.3 (0.1–0.8)	0.021
Nagelkerke R^2	0.192	

Note: Pain (activity discomfort), repetitive movements, constant back strain, pseudoneurology, musculoskeletal pain, and "other complaints that affects health" did not reach $P < 0.20$ and were excluded from further analysis.
*Odds for non-return *versus* return.

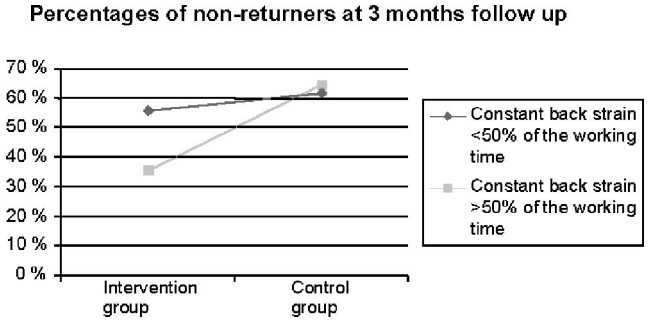

Figure 1. Percentages of non-returners at 3-month follow-up.

being included in the spine clinic group and thus might have biased their responses.

The intervention was short and simple and had a significant effect on patients susceptible to the treatment. Although the treatment was given at a spine clinic, the focus on activity and fear reduction may equally well be used in primary health care. Patients that believe that they will not recover from their back pain may need more time and more information both to reduce the fear of not recovering, and to reduce the fear of pain. They may also need more encouragement to stay active. It is possible that patients with more severe and complex problems are in the need for more complex intervention with more special attention given to reduce anxiety and to improve coping skills.[47,48]

There is no single answer to the conundrum of disability due to LBP. Returning to work and coping at the worksite are often difficult.[49,50] Work-related psychosocial factors play an important role in persisting symptoms and disability, and influence response to treatment and rehabilitation.[46] Significant prognostic factors include workplace support and modification of duties.[13] Workplaces should be "comfortable when we are well and accommodating when we are ill."[51] Healthcare professionals may facilitate return to work by establishing what the patients' worries really are, to identify the reasons for avoidance of physical activity and the fear of pain at an early stage, in order to tailor advice and reassurance appropriately.[6,29,30]

This intervention takes place at a stage where the prognosis no longer is as positive as in the early stage of an acute LBP. There is strong epidemiologic evidence that the longer the length of absence from work due to LBP, the lower the chances of ever returning to work.[46] Even if we were able to increase the return to work, and even if we believe we know how to identify the patients that benefit from our treatment, it is far too many we do not reach, and far too many we really do not know how to treat. This remains a challenge for future research.

■ Key Points

- This study assessed factors influencing treatment effects on sick leave in patients with subacute low back pain.
- Potential predictors for prolonged sick leave in both the intervention group and the control group were high psychological work load, perceived large reduced ability to work, belief that work would aggravate the condition, other illnesses, and other subjective health complaints.
- The strongest modifying effects on the treatment results in the intervention group were for patients with perceived large reduced ability to work and constant back pain when working, and a high score on gastrointestinal complaints.

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