

## OCCUPATIONAL DISORDERS AND RETURN TO WORK: A RANDOMIZED CONTROLLED STUDY

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**Objective:** Goal setting and motivational factors are strongly associated with maintaining a job and return to work after sick leave, but research into the effects of interventions targeting these factors is limited. We conducted a randomized controlled study to examine the vocational effect of intervention focusing on motivation, goal setting and planning for return to work.

**Design and methods:** Of 243 patients at risk of long-term sick leave or job dropout, 184 (76%) provided complete baseline information for the study. After randomization to an intervention group ( $n = 92$ ) and a reference group ( $n = 92$ ), occupational physicians examined the participants in accordance with standard guidelines. The intervention group received additional support from a social worker in order to enhance goal setting, motivation and planning for return to work. After 1 year 163 participants (89%) provided data on general health and employment status. The risk of not being gainfully employed was analysed by logistic regression analysis with adjustment for several covariates.

**Results:** The intervention did not increase the likelihood of gainful employment after 1 year or reduce the average number of days of sick leave.

**Conclusion:** A low-cost counselling program addressing motivation, goal setting and planning for return to work did not improve vocational outcomes or reduce sick leave among patients with work-related disorders.

**Key words:** intervention study, occupational disorders, return to work, sick leave, randomized controlled study.

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### INTRODUCTION

Work-related disorders require considerable healthcare resources and contribute strongly to long-term sick leave and disability (1–3). Over the past few years, several studies have examined determinants for return to work (4–15), in particular among patients with musculoskeletal pain. Low-level education, unskilled work, female gender and higher age are consistently

related to low return to work in most studies. While the medical diagnosis has surprisingly limited predictive value (16), several studies now indicate that the psychological state and trait characteristics as well as motivational factors are strong predictors of duration of sick leave and return to work (17–21). Perception of ability to work, skills in personal pain control and general perception of health have hence been shown to determine whether return to work rates are high or low (22, 23).

The significance of early intervention is often emphasized, but controlled studies on the effects of early rehabilitation for work-related disorders are few and the evidence is conflicting (24–26).

Intensive, costly and multidisciplinary rehabilitation programs, which include physical training, information, education and social interaction, seem to improve health and return to work, particularly in severely disabled patients with chronic low back pain (27–30). However, less costly interventions have not produced consistent, beneficial results (31–33) and may even increase the duration of sick leave and delay return to work compared with unstructured treatment of varying intensity (25).

This study is based on the assumption that goal setting and motivational factors are strong predictors for return to work (17–21). We hypothesized that a low-cost counselling program focusing on motivation, positive feedback, support for goal setting, planning for return to work and practical advice would promote health, maintain gainful employment and increase return to work in a population of patients referred to an occupational university clinic for work-related disorders. This hypothesis was examined in a randomized controlled study.

### METHODS

The randomized controlled trial was undertaken at the university occupational medicine outpatient clinic in Aarhus, Denmark. The catchment area is semi-rural and includes approximately 600,000 inhabitants. Patients from all sectors of industry and service are referred to the clinic by general practitioners, trade unions or employers. Informed and written consent was obtained from all participants. The project was approved by the local ethics committee and the Danish Data Protection Agency.

Patients were invited to participate if they answered “yes” or “maybe” to the following question at the end of the initial clinical examination: “Do you expect difficulties in returning to or staying in gainful employment because of your current health situation?” The information given by the clinicians at enrolment including the precise phrasing of the above question was written in the study protocol and all inclusions were reviewed at a daily clinical conference during the study period in order to standardize the enrolment criteria between physicians. Patients were ineligible if they were pregnant, had a malignant disorder, or were judged to qualify for early retirement pension on medical grounds.

Table I. Characteristics of the source population

Characteristics	Not fulfilling inclusion criteria (n = 780)	Fulfilling inclusion criteria (n = 243)		
		Intervention group (n = 92)	Reference group (n = 92)	Refused to participate (n = 59 <sup>1</sup> )
Women (%)	42.8	64.1	60.0	47.5
Age, mean (SD)	43.5 (10)	43.7 (11)	41.0 (10)	45.5 (10)
Line of business				
Industry (%)	39.9	34.7	48.5	46.8
Service and healthcare (%)	27.6	30.5	22.8	27.7
Other (%)	32.2	34.7	28.7	25.5
Medical diagnosis <sup>2</sup>				
F: psychiatric disorders (%)	1.2	4.2	3.0	2.5
G: neurological disorders (%)	4.0	6.3	7.9	5.0
J: airway and lung disorders (%)	7.6	1.1	4.0	0.0
L: skin disorders (%)	6.9	2.1	4.0	5.0
M: low back disorders (%)	23.5	18.5	19.6	17.0
M: other musculoskeletal disorders (%)	30.6	49.5	40.6	44.6
Other disorders and unspecific symptoms	45.9	31.5	38.4	42.4
Compensation claim (%)	62.6	71.7	69.2	61.0
Gainfully employed	60.3	30.4	34.8	40.9

<sup>1</sup>Included 7 subjects who withdrew their participation during follow-up and 12 subjects who did not provide complete information at baseline.

<sup>2</sup>According to ICD10 main groups.

#### Randomization

Among the 1022 patients who were referred from 2 January 1999 to 30 June 2000, 243 (23.8%) fulfilled the inclusion criteria and 203 (83.5%) gave informed consent. Following the occupational health examination, the patients were assigned to the intervention (n = 102) or the reference (n = 101) group by means of a consecutive number attached to all hospital notes during the enrolment period. All numbers had been randomly assigned to 1 of 2 groups by computer and the file was kept confidential by 1 secretary. Seven patients withdrew from the study before the intervention was completed and another 12 did not provide adequate information at baseline. Thus, the final sample comprised 184 patients (76% of the 243 eligible patients), divided equally between intervention and reference groups (Table I).

#### Reference program

Before randomization, all referred patients underwent clinical examination by 1 of 10 physicians. Diagnoses were set according to the Danish edition of the 10th International Classification of Diseases (ICD-10). Patients received information about the disease (if any), possible relation to earlier job exposures and the prognosis for the disorder. Counselling was provided in accordance with the clinic's standard guidelines. This included advice with respect to elimination or reduction of potentially harmful job-related exposures, change of work tasks and job routines, need for job training, transfer to other job tasks, rehabilitation or additional formal education. Contrary to the intervention program, the counselling was not reinforced by additional support, follow-up or contact with the workplace or social authorities.

#### Intervention program

All patients randomized to the intervention group were seen by 1 social worker. Each patient was counselled on average 2.2 (range 1–7) times for 1–2 hours each session, starting as soon as possible after the medical examination (on average 18 days, range 5–112 days). Delayed first meetings with the social worker were mainly due to the need for additional medical examinations or had logistical causes such as holidays. The dialogue took as its starting point the patient's own perception of their present situation, health, thoughts and expectations with respect to future work possibilities. The objective of the counselling was to inspire, encourage and motivate the patients to goal setting and planning of how to maintain work or return to work. Communication was performed according to systemic thinking theory and included principles of circular thinking, reflection and future vision (34). The counselling resulted in an

agreed rehabilitation plan and during the first 3-month period the social worker provided additional encouragement and support to ensure that the plan was put into action by contacting the client, the employer, the general practitioner, social authorities, employment exchange and rehabilitation institutions. The number of contacts by telephone or in writing during follow-up averaged 11 (range 0–39) and on average 1.4 meetings (range 0–3) was held with the social authorities (83% of meetings) or managers at the workplace (13% of meetings). With few exceptions the patient took part in these round-table meetings. The variation in number of contacts with the patients reflects the variation in the effort needed to arrive at an agreed plan for maintaining or returning to work. The contents of the rehabilitation plan included additional job training (40%), intensive support to seek gainful employment (25%), adjustment of the workplace, or transfer to other job tasks (13%), rehabilitation at a specialized institution for intensive vocational training (12%) or additional formal education (10%). The rehabilitation plan was implemented for 80.4% of patients according to information obtained by the social worker 3 months after the first meeting.

#### Data collection and outcome measures

One year after enrolment, the outcomes were assessed via a postal questionnaire that was completed by 163 of participants (83%) after 1 mailed reminder. Three outcomes were defined *a priori* to evaluate the effect of the intervention: (i) regular and gainful employment at a workplace on the date of the follow-up (yes/no). Participants who were on vacation, off duty, had short-term sick leave or part-time regular work were considered to be in gainful employment; (ii) the duration of sick leave from the date of enrolment until the sick leave was terminated or 364 days had elapsed; (iii) health-related quality of life as assessed by the Danish Short Form 36-item Health Survey (SF-36), covering 8 health and social functioning dimensions: physical function, role physical functioning, bodily pain, general health, vitality, social functioning, emotional role and mental health (35).

The SF-36 profile was scored using the original 0–100-point scoring algorithms (36). We computed the mean scores on all dimensions as well as the average total SF-36 score.

#### Statistical analysis

The dichotomized outcome gainful employment (yes/no) was analysed by logistic regression analysis providing the odds ratio and 95% confidence limits for participants in the intervention group compared with the reference group (37). The crude odds ratio (OR) was adjusted by

a fixed set of covariates that were considered for *a priori* inclusion: gender (male/female), age (3 dummy variables: <30 years, 30–49 years, ≥50 years), occupational disorder (yes/no), duration of sick leave on enrolment (3 dummy variables: 1–30 days, 31–90 days, >90 days), average total SF-36 score (<50/≥50), employment status (unemployed: yes/no), education (skilled: yes/no).

The average number of days on sick leave in the intervention group was compared with the corresponding number in the reference group after 90, 180, 270, 360 and 430 days by means of a *t*-test. We also compared the slopes of the sick leave regression lines for the 2 groups by multiple linear regression (38).

For the 8 dimensions of the SF-36, we computed the within subject difference from enrolment to follow-up and for each dimension we tested for change during the follow-up period. Finally, a *t*-test of the paired differences was applied in order to analyse whether changes across the follow-up period differed between the intervention and the reference group.

## RESULTS

Female patients and those with musculoskeletal disorders were over-represented in the subset of referred patients who were eligible for the intervention study (Table I). Women were also over-represented in the intervention group after randomization, and the subjects in this group were slightly older, more likely to have musculoskeletal disorders and were less often employed in industry than subjects in the reference group. Otherwise, the differences were small (Tables I and II). For instance, the total SF-36 score was about 50 on a 0–100 scale in both groups.

The proportion of patients having gainful employment was 31% at enrolment into the study and 42% after 1 year. The increase in the frequency of patients with gainful employment was largely of the same magnitude in the intervention (10.9%) and the reference group (10.0%). Thus, intervention did not increase the likelihood of being employed after 1 year (Table III). The proportion of patients in full-time vocational training was 35% in the intervention group and 25% in the reference group at the 1-year follow-up.

Female gender and long-term sick leave before enrolment were strongly associated with reduced likelihood of employment, while a high level of social functioning increased the likelihood of employment after 1 year (Table III). The dimensions of the social functioning index accounting for the association with

Table II. Baseline characteristics of 163 patients who completed a 1-year follow-up questionnaire after randomization to an intervention and a control group

Baseline characteristics	Intervention group (n = 83)	Reference group (n = 80)
Status on enrolment (%)		
Employed	28.9	35.0
On sick leave	54.2	45.0
Without job	16.9	20.0
Duration of sick leave/unemployment before enrolment (%)		
0–30 days	45.8	56.3
31–90 days	21.7	16.3
>90 days	32.5	27.4
Type of employment (%)		
Unskilled	39.9	40.0
Skilled	49.4	55.0
Salaried employment	10.7	5.0
Perception of job characteristics in last held job (scale score 0–10), mean (SD)		
High job demands	8.2 (2)	8.3 (2)
Low job control	4.5 (2)	4.6 (2)
Low social support	3.2 (2)	3.3 (2)
Social functioning (SF-36), scores 0–100, mean (SD)		
Total score	50.1 (15)	50.5 (18)
Physical functioning	69.8 (19)	73.1 (18)
Role physical	16.3 (28)	25.6 (35)
Bodily pain	38.7 (20)	36.4 (23)
General health perception	51.8 (21)	47.9 (22)
Vitality	38.9 (22)	36.8 (22)
Social functioning	75.6 (22)	71.1 (27)
Role emotional	49.0 (44)	54.6 (40)
Mental health	59.9 (20)	56.1 (25)

higher rate of employment at follow-up were perception of general health (OR 1.6 (75% CI 1.0–2.6)) and role emotional (OR 1.5 (95% CI 1.1–2.0)). Adjustment for baseline differences between the intervention and the reference group with respect to these variables did not change the effect related to the intervention (Table III).

The within person changes in the SF-36 dimensions stratified on the randomization arms are displayed in Fig. 1. The total SF-36 score rose on average by 12.0% in the intervention group

Table III. Crude and adjusted<sup>1</sup> odds ratios with 95% confidence intervals for gainful employment 1 year after enrolment in 163 patients with work-related disorders

	At work	Not at work	Odds ratio	Odds ratio <sub>adj</sub>	95% confidence interval
Randomization, n (%)					
Intervention group	33 (39.8)	50 (60.2)	0.81	0.85	0.42–1.70
Reference group	36 (45.0)	44 (55.0)	1.00	1.00	–
Gender, n (%)					
Women	35 (34.4)	67 (65.6)	0.4	0.41	0.20–0.84
Men	34 (55.7)	27 (44.3)	1.0	1.0	–
Social functioning (score 0–100), mean (SD)					
20 unit increment	55 (17)	47 (15)	2.4	2.3	1.12–4.54
Duration of sick leave before enrolment, days					
30 units increment	36.6 (72)	133.1 (204)	0.79	0.81	0.71–0.92

<sup>1</sup>The following determinants at enrolment were adjusted for: gender, age, occupational disorder, duration of sick leave on enrolment, average SF-36 score, employment status and education (see text for details).

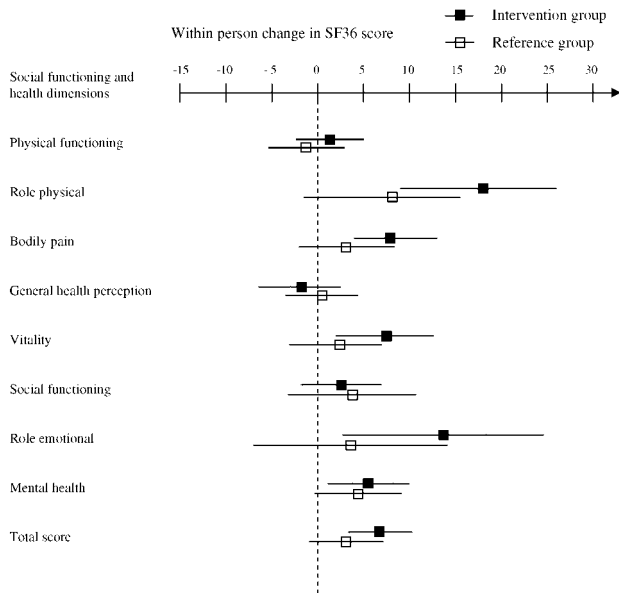


Fig. 1. The mean within-person difference of SF-36 social functioning and health scores by randomization group. Bars indicate 95% confidence limits.

and by 5.0% in the reference group, but the within person changes across the follow-up period were not significantly different for any of the 8 dimensions when the changes in the intervention group were compared with the corresponding changes in the reference group. However, both the total score and 6 of the 8 dimensions improved more in the intervention group than in the reference group.

At the time of enrolment about two-thirds of the participants had asked for workers' compensation (Table I). The compensation claim was not related to vocational status, duration of sick leave or change in any of the SF-36 dimensions after 1 year (data not shown). Moreover, no interaction between compensation claim and intervention was observed.

The average number of days on sick leave was in the same range in the intervention and the reference group, but declined at a higher rate during the follow-up period in the intervention group (Fig. 2). However, the slope of the decrement of sick leave was not significantly different from 1 group to the other.

### DISCUSSION

We examined an intervention that addressed motivation, goal setting and planning for return to work among patients referred to an occupational health clinic for work-related disorders and found no effect after 1 year with respect to obtaining gainful employment, duration of sick leave and perceived health and social functioning.

This lack of effect can be interpreted in several ways. Although motivation and goal setting have been demonstrated strongly to predict return to work in several surveys (8, 19, 21, 23, 39), it may be hard to modify or enhance these factors by a focused dialogue of a few hours' duration. The study included

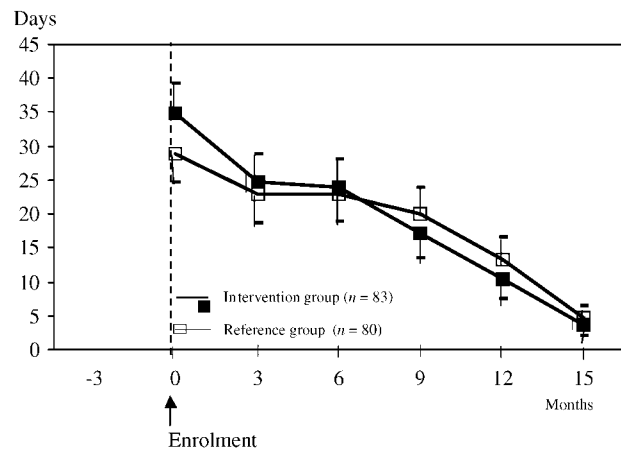


Fig. 2. The average numbers of days sick leave for 3-month periods before enrolment and during 1 year of follow-up by randomization group. Bars indicate the standard error.

all patients with work-related disorders who anticipated difficulties in maintaining or returning to their job because of their current health situation. Thus the study group is probably rather heterogeneous. Some may have anticipated difficulties in returning to work because of severe health problems *per se*, others mainly because of mismatch between health and current working conditions, and finally, lack of interest in continuing to work may also be important in some cases. Perhaps only a minor proportion of the patients were genuinely responsive to external support and advice (20). The study size did not allow analysis of effects in subgroups defined by, for instance, age, gender, disorder or type of employment.

In spite of randomization, the intervention group turned out to be somewhat disadvantaged with respect to several characteristics associated with reduced likelihood of regular employment; for instance higher age, higher frequency of musculoskeletal disorders and unemployment. However, these differences were probably adequately accounted for by the multivariate statistical modelling and were, therefore, not a likely explanation of the lack of effect.

Our intervention was based on a low-cost program in order to facilitate the transfer and implementation of effects to occupational health practices at large. Other studies have demonstrated effects on vocational outcomes of more demanding and expensive multidisciplinary programs involving psychologists, physiotherapists, social workers, occupational physicians and vocational counsellors. In 1992 a meta-analysis of 65 studies dealing with chronic back pain indicated that multidisciplinary treatments are superior to no treatment, waiting list, as well as single-discipline treatments such as medical treatment or physical therapy (29). This conclusion has been corroborated by later randomized controlled studies of patients with chronic disabling low back pain (27, 28), non-specific musculoskeletal pain and (39) adjustment disorders (40); although the results are not entirely consistent (25). However, our findings seem to be in line with other studies of less intensive

intervention programs with focus on active sick leave (30) and information (31).

The occupational physicians superimposed the intervention on "standard" counselling practice, but standard support and counselling may, in fact, provide all that can be gained in this group of patients. However, the frequency of gainful employment on enrolment was 33% and only increased moderately, to an average of 43%, after 1 year. Since severely disabled patients with few options to return to normal work were ineligible for the study, we would expect a higher potential for gainful employment after 1 year than the observed level of less than 50%. For the same reason, the lack of effect can hardly be explained by a rub-off effect on the standard counselling performed by the occupational physicians.

The social network may be important in supporting the patient's efforts to put plans into action. This issue was not addressed in the present study, but we have no reason to expect an unbalanced distribution of social networks on randomization groups.

However, it is important to notice that since the intervention resulted in initiation of further training and education among 35% of patients, compared with 26% in the reference group, we would – other things being equal – expect a lower frequency of patients in regular employment after only 1 year of follow-up. This indicates a need for additional follow-up after some 3 years.

Even if we cannot discard the possibility of a long-term effect of the intervention, it seems likely that other factors not addressed in this study are important for maintaining employment and return to work among patients with work-related disorders. For example, Ekberg & Wildhagen found that long-term sickness absence was associated more with working conditions than with individual characteristics (3). If so, the direct involvement of the workplace and collaboration with management or the on-site occupational health service might be beneficial (24, 41). However, in Denmark only a few large workplaces have an internal occupational health service. Moreover, workplace visits by healthcare units may not necessarily add to improved rehabilitation (25).

It has been suggested that counselling and assistance by rehabilitation agencies is more likely to result in dependence than readjustment (42). However, in our study the patients in the traditional counselling group who were left to depend on their own decisions and initiatives were not performing better than the intervention group.

Several studies indicate that worker compensation claimants have less favourable vocational outcomes, perhaps because the compensation system tends to keep the patients in a sick role and because it reduces the incentive to take responsibility and initiatives to get back into work (43). The present study does not support this view. Work or compensation claimants did not have less favourable vocational outcomes or a reduced health and social functioning index. A negative impact on return to work of the worker compensation system is expected to be highly dependent on the setting and the social security systems at large.

## CONCLUSION

A low-cost counselling program addressing motivation, goal setting and planning for return to work did not improve vocational outcomes, duration of sick leave or perceived health and social functioning in patients with work-related disorders.

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