

Reduction of Job Loss in Persons With Rheumatic Diseases Receiving Vocational Rehabilitation

A Randomized Controlled Trial

Saralynn H. Allaire, Wei Li, and Michael P. LaValley

Objective. Job loss is a major consequence of rheumatic diseases, and clinicians may refer patients to vocational rehabilitation for help. When provided after job loss, the impact of vocational rehabilitation is short term. This randomized controlled trial with 48 months of followup was undertaken to determine the efficacy of vocational rehabilitation provided to persons with rheumatic diseases while they are still employed, but at risk for job loss.

Methods. A total of 242 patients with rheumatic diseases residing in Massachusetts were recruited through their rheumatologists for study. Participants were randomly assigned to the experimental group ($n = 122$) or the control group ($n = 120$). Subjects in the experimental group received two 1.5-hour sessions of vocational rehabilitation; those in the control group received print materials about disability employment issues and resources by mail. The main outcome assessed was the time to first job loss. Job losses were defined as permanent disability, premature retirement, or a period of unemployment. All analyses were conducted on an intent-to-treat basis.

Results. Job loss was delayed in the experimental group compared with the control group ($P = 0.03$ by log rank test). After adjustment for confounders, participation in the experimental group was found to be protective against job loss (odds ratio 0.58 [95% confi-

dence interval 0.34–0.99], $P = 0.05$ by pooled logistic regression).

Conclusion. Vocational rehabilitation delivered to patients at risk for job loss, but while they were still employed, delayed job loss. Such an intervention has the potential to reduce the high indirect costs, as well as the personal impact, of rheumatic diseases.

Health-related job loss is a major consequence of rheumatic diseases. In the most recent analyses (1), costs stemming from lost wages, so-called indirect costs, for all forms of arthritis were 74% of the total costs, while the direct costs of medical care were 26% of the total. This burden can be expected to increase because the portion of the US work force that is 55 years of age and older is increasing (by 2020, it will account for one-fifth of the work force) (2) and because the incidence and prevalence of many rheumatic diseases rise substantially after age 50 years. Health-related job loss also exacts a substantial toll on the quality of life of individuals, being associated with lower levels of self-esteem, life satisfaction, adaptation, perceived health status, and in those with rheumatoid arthritis, higher levels of depression and pain (3–5).

Vocational rehabilitation is one approach to addressing health-related job loss. Rheumatologists and other clinicians may wish to refer their patients with rheumatic diseases to vocational rehabilitation for help. However, there is a shortage of studies evaluating the effectiveness of vocational rehabilitation. Studies that have been done suggest that while it can be effective in helping persons with disabilities regain employment, this effect is often short-lived (6). Moreover, there are a host of obstacles associated with the task of regaining employment, including the prominence of discrimination in the hiring process (7). Further, the individual may have

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come to accept his or her inability to work. Providing vocational rehabilitation to persons who are at risk for job loss, but while they are still employed, may be more effective and may require a relatively brief intervention.

To evaluate the efficacy of vocational rehabilitation provided as primary prevention, we conducted a randomized controlled trial of vocational rehabilitation provided to persons with rheumatic diseases who were at risk for job loss, but while they were still working. We selected an at-risk sample to maximize the effect of the intervention and because such persons would receive priority for services. Our hypothesis was that vocational rehabilitation given to individuals in this situation would prevent job loss. Vocational rehabilitation provided to employed persons has been called job retention vocational rehabilitation (8), and we will refer to the intervention tested in this study as such.

SUBJECTS AND METHODS

Study participants. Participants were employed persons with a rheumatic disease who were at risk for job loss and who resided in eastern Massachusetts. Recruitment was carried out through rheumatologists, who sent letters about the study and a screening form to their patients who had a diagnosis of rheumatoid arthritis, knee osteoarthritis, systemic lupus erythematosus, ankylosing spondylitis, or psoriatic arthritis and were ages 18–65 years. The screening form inquired about a patient's employment status and interest in participating in the study. Patients who returned the form and were employed were telephoned to further assess their eligibility status.

Risk of job loss was a positive response to the question, "Do you have any concern about your health affecting your ability to work now or over the next few years?" Other criteria were as follows: no plans to retire or move from the area within the next 2 years, willingness to commit to the requirements of the study, and for those with knee osteoarthritis, no plans for knee replacement surgery within the next 6 months. Eligible patients were mailed consent forms that had been approved by the Institutional Review Board of the Boston University School of Medicine. Those who returned signed consent forms were telephoned in order to collect the baseline data. Patients who completed the baseline data collection were enrolled in the trial.

Protocol design. This study was a randomized controlled trial of job retention vocational rehabilitation with up to 48 months of followup. After enrollment, trial participants were stratified based on age, rheumatic disease, and location of residence within the economically diverse area, in order to control for these potentially confounding factors (9,10), and then randomized to the experimental or control group. Strata allocation lists were generated by the statistician and included in an Access database in such a way that treatment assignment was revealed only after a participant's characteristics were entered into the database.

Participants in the experimental group received job

retention vocational rehabilitation services, while those in the control group received an intervention to control for the benefit of interaction. The original study period allowed for followup to assess job loss differences between the 2 groups for 12–36 months postintervention. Funding subsequently became available that allowed for an additional year of followup. Participants who remained in the study and were not permanently disabled or retired were invited to participate in the additional year of followup. The study was conducted between January 1, 1998 and August 31, 2002. Recruitment was staggered over the first 22 months to allow time for the interventions to be delivered. The interventions were delivered between March 1998 and February 2000; followup took place between July 1998 and August 2002.

Interventions. The job retention vocational rehabilitation intervention was developed from previous research findings (11) and in consultation with experienced rehabilitation counselors. It was delivered by one of two rehabilitation counselors employed by the study; both counselors had several years of experience, but no particular expertise in job retention vocational rehabilitation. The intervention consisted of 3 components: job accommodation, vocational counseling and guidance, and education and self-advocacy. Job accommodation represents any change in the work environment or in the way a job is performed that enables a person with a health condition to do his or her job effectively. The job accommodation component of our intervention consisted of an assessment of possible health-related work place barriers to job performance (e.g., difficulty handling objects, working the required number of hours, or doing repetitive tasks) and development of solutions to the barriers that a participant had identified. The Work Experience Survey tool was used to facilitate identification of barriers, as well as solutions for them (12). We augmented the tool in order to assess possible barriers to employment posed by difficulty in commuting, performing household and family work, or completing rheumatic disease self-care.

In the vocational counseling and guidance component, the counselor and participant evaluated the individual's job in light of his or her rheumatic disease. If problems were foreseen, possible job alternatives, requirements, and relevant resources were identified. In addition, the counselors conveyed positive messages about each participant's ability to work (11). In the education and self-advocacy component, information about legal rights and responsibilities (such as the employee's responsibility to request accommodation when needed), guidance regarding disclosure issues, and skills training to increase the participant's ability to request a job accommodation in an appropriate manner were provided (13). The counselors also gave the participants in the experimental group copies of pamphlets and flyers about how to manage health-related employment problems and about other available resources.

After randomization, the assigned counselor telephoned a participant to make an appointment for the first of 2 meetings. Each meeting lasted ~1.5 hours; this amount of time was determined in consultation with experienced rehabilitation counselors and was based on prior testing of the time needed to carry out the required activities. Additional time was available if desired. The meetings were conducted in a local office of the state vocational rehabilitation program, at a participant's home, or in a public area such as a library. For

most participants, the entire intervention was completed within 5 months of randomization; however, a longer period was needed in a few cases, the longest being 9 months.

Control group participants were given copies of the same pamphlets and flyers about how to manage health-related employment problems and available resources that the experimental group participants received. These materials were mailed to the home addresses of the control group participants within 1 month after randomization.

Data collection. Data were collected by telephone; examples of complex response mechanisms and categories (e.g., 10-point scales and responses to questions on the Health Assessment Questionnaire [HAQ]), were mailed to participants prior to each data collection telephone call to facilitate answering. Information about demographic, disease, and job characteristics was collected at baseline. Demographic information included age, sex, race/ethnicity, education, marital status, and personal income. Disease information consisted of specific diagnoses and functional limitations. Self-reported diagnoses were confirmed with the participants' rheumatologists. We used the disability index of the HAQ (14) to assess functional limitation (range of possible scores 0–3).

Information about job characteristics included the title and 3 main duties of participants' primary job and the physical demands and autonomy of these jobs. Job type was classified according to 12 main categories in the Dictionary of Occupational Titles (15), using the information about job title and 3 main duties. Because of the relatively small sample size and because professional and managerial jobs are associated with a reduced risk of work disability, job type was subsequently dichotomized into professional (e.g., accountant, lawyer, teacher) and managerial jobs versus all other types of jobs. Job physical demands and job autonomy (i.e., a worker's control over the work pace and other aspects of work) were each assessed using scales from the 1978 Survey of Disability and Work (16,17).

Outcomes. The main outcome was the time to the first of either of 2 types of job loss: permanent job loss, consisting of permanent disability or retirement, or temporary job loss, consisting of a period of unemployment. The classification of job losses was based on participants' reports of their work status at each 6-month followup. Participants were asked if they were employed, unemployed, permanently disabled, retired, or if they were on a disability leave from work. A report of unemployment in 2 consecutive 6-month intervals was considered 1 temporary job loss. Subjects who were on a disability leave from work were classified as employed if they were still officially employed. Participants who were not employed and who considered themselves to be permanently disabled and/or received disability income support were classified as permanently disabled. Because the reasons for retirement could be unrelated to health, it was considered as a job loss only if it occurred within 2 years of study enrollment (see eligibility criteria) or, if it occurred after that time, prior to age 65 years. With that exception, all job losses were counted because we believed that health was a likely consideration in most, if not all, cases.

There were 2 secondary outcomes. Because of the particular importance of permanent job losses, we examined the time to permanent job loss alone. Also, because the incidence of job loss is important, we examined in both study

groups the differences in the counts of permanent and temporary job losses combined.

Statistical analysis. The sample size was calculated to allow detection of a 40% difference in the rate of job losses between the experimental and control groups with 83% power, assuming a dropout rate of 15% over the first 24 months of followup. Power was based on a 2-sided test with a significance level 0.05 for the hypothesis of equal job loss rates.

The demographic and disease characteristics of the experimental and control groups were compared by unpaired *t*-test or chi-square test. The proportions of participants in the 2 groups who completed the study were calculated, and the counts of different types of job losses in the 2 groups were obtained.

Analyses that compared the experimental and control groups by outcome were conducted on an intent-to-treat basis. Censoring was by time of last data collection or job loss event. The log rank test was used to test for a survival difference in the time to first job loss between the 2 groups. Kaplan-Meier curves were constructed to illustrate the proportion of participants in each group who remained employed with no job loss over time. We then used pooled logistic regression to estimate the reduction in odds of combined job loss and of permanent job loss alone in the experimental versus control group in order to adjust for potential confounders. This method is appropriate when outcomes are assessed at fixed intervals (18). Confounders were primary factors found in previous studies to be associated with arthritis work disability (i.e., age, functional limitation, and type of job) (19,20).

Poisson regression was used to analyze the counts of permanent and temporary job losses combined because more than 1 event per participant could be included in the analysis. Also, adjustment for other factors was possible.

RESULTS

Recruitment and retention of study participants.

A total of 2,545 patients were contacted about the study; 912 of them returned the screening form. Of these, 558 patients were excluded because they did not meet eligibility criteria, 58 patients declined to participate, and 54 patients could not be reached by telephone or did not sign the consent form. Thus, 242 participants were randomized to receive the experimental intervention (job retention vocational rehabilitation; $n = 122$) or the control intervention (print materials about disability-related employment information; $n = 120$). One experimental group participant did not receive that intervention because of scheduling problems, and 2 control group participants reported not receiving the printed materials, although the materials were mailed twice to confirmed addresses. All participants enrolled in the study were included in the intent-to-treat analyses.

During the original 36-month study period, 4 participants in the experimental group and 6 in the control group dropped out of the study, and 1 subject in

Table 1. Baseline characteristics of the study sample

Characteristic*	Experimental group (n = 122)	Control group (n = 120)	P
Age, mean ± SD years	50 ± 9.4	49 ± 9.8	0.37
Female, %	81.2	81.7	0.92
White, %	92.6	92.5	0.97
Educated beyond high school, %	39.2	31.2	0.19
Inflammatory arthritis, %	63.9	62.5	0.97
HAQ score, mean ± SD	0.51 ± 0.4	0.57 ± 0.4	0.24
Professional/managerial types of job, %	35.2	30.8	0.47

* Subjects reporting inflammatory arthritis had rheumatoid arthritis, ankylosing spondylitis, or psoriatic arthritis. HAQ = Health Assessment Questionnaire.

each of the groups died. One hundred nine experimental group participants remained in the study, were still employed, and thus were eligible to take part in the additional year of followup. Ninety-three chose to do so; 1 participant subsequently dropped out. In the control group, 96 participants were eligible to take part in the additional year, and 81 did so; 1 participant dropped out during this year, and another died. Considering all participants who dropped out (including eligible participants who chose not to continue for the additional year) or died over the 48-month study period (n = 46), the attrition rate was 18% in the experimental group and 20% in the control group.

Characteristics of the study sample. The mean age of the 242 study participants was 49.5 years (range 24–66 years); 197 participants (81%) were women, and 224 (93%) were white. Most participants (n = 142) had rheumatoid arthritis; 53 had osteoarthritis of the knee, 36 had systemic lupus erythematosus, 8 had ankylosing spondylitis, and 3 psoriatic arthritis. Their mean HAQ score for functional limitation was 0.54 (range 0–1.7), which is in the range of mild limitation in persons with rheumatoid arthritis (21). Eighty-five subjects (35%) had more than a high school education, while 80 subjects (33%) had professional or managerial occupations.

There were no statically significant differences in these characteristics between the experimental group and the control group (Table 1).

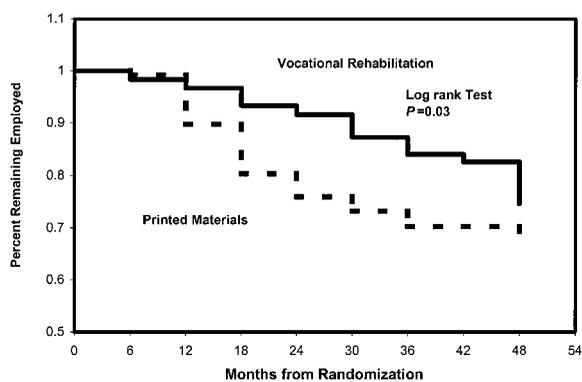
Job loss events. Table 2 shows the counts of different types of job loss in the experimental and control groups. At 48 months of followup, only 25 permanent and temporary job losses combined occurred in the experimental group, compared with 48 in the control group. Of the permanent job losses alone, 12 occurred in the experimental group and 22 in the control group. Of the temporary job losses alone, 13 occurred in the experimental group versus 26 in the control group. Fifty-eight participants had at least 1 job loss. In the experimental group, 18 subjects had 1 job loss, and 3 subjects had 2. In the control group, 26 subjects had 1 job loss, 10 subjects had 2, and 1 subject had 3.

Time to job loss. The survival curve for permanent and temporary job losses combined is shown in Figure 1. Beginning 12 months postintervention, a greater percentage of experimental group participants than control group participants remained employed with no job loss. The difference between the groups increased at 18 months and was sustained over 42 months. The difference between the groups was statistically significant (P = 0.03 by log rank test). The lower numbers of

Table 2. Job loss events over the 48 months of study

Type of job loss*	Experimental group (n = 122)	Control group (n = 120)	All study subjects (n = 242)
No. of permanent and temporary job loss events combined	25	48	73
No. of permanent job losses only	12	22	34
No. of temporary job losses only	13	26	39
No. of participants with job loss events			
One event	18	26	44
Two events	3	10	13
Three events	0	1	1

* Permanent job loss events consisted of disability or premature retirement. Temporary job loss events consisted of a period of unemployment.



Vocational rehabilitation	122	122*	120	117	111	107	100	78	57
Printed materials only	120	119*	118	105	94	86	81	71	52

Figure 1. Time to first job loss event in the 242 participants enrolled in the study, by experimental group. * = Study participants without a prior job loss event.

participants in the latter time periods shown in Figure 1 is primarily due to the fact that recruitment was staggered over time rather than being due to attrition. The pattern of differences between the groups was similar for the outcome of permanent job loss alone ($P = 0.06$).

Results of the pooled logistic analyses are shown in Table 3. Participation in the experimental group was protective against job loss. The odds ratio was 0.58 (95% confidence interval [95% CI] 0.34–0.99; $P = 0.05$) for time to either permanent or temporary job loss, whichever came first. None of the other variables was significant. For time to permanent job loss alone, the odds ratio was 0.49 (95% CI 0.24–1.02; $P = 0.06$).

Job loss counts. Persons in the experimental group had a 49% reduction (95% CI 17–69; $P = 0.007$) in the combined number of permanent and temporary job losses compared with individuals in the control group. After adjustment for age, degree of functional limitation, and type of job, none of these features was significant.

Table 3. Job loss outcome (time to permanent or temporary job loss) in the experimental group*

Job loss outcome	Odds ratio	95% confidence interval
Permanent or first temporary job loss	0.58	0.34–0.99
Permanent job loss only	0.49	0.24–1.02

* Adjusted for age, functional limitation, and job type.

DISCUSSION

The results of this randomized controlled trial showed that vocational rehabilitation effectively prevents job loss when it is provided to persons with rheumatic diseases who are at risk for job loss but are still employed. Job loss was both delayed and reduced in incidence among study participants who received the job retention vocational rehabilitation intervention. Such an intervention therefore has the capacity to reduce the high indirect costs associated with rheumatic diseases. Furthermore, because the intervention was relatively brief and the effect persisted over 3.5 years of followup, it should be an inexpensive intervention to deliver.

The 2 main sources for job retention intervention for persons with health impairments are agencies that provide vocational rehabilitation and employers. The federal and state governments in the US jointly fund a public vocational rehabilitation program that is available to eligible persons who have a wide variety of impairments. Services are provided at the state level. Currently, patients with disabling health conditions may obtain job retention services through the public vocational rehabilitation program, and referral of patients with health-related employment problems to this program is recommended.

In the past, relatively few persons with rheumatic diseases have received services from the public vocational rehabilitation program (22). Rheumatologists and other health care providers are the main source of referrals to vocational rehabilitation for patients with rheumatic diseases. Although some patients go through medical rehabilitation, little attention is given to employment even in this setting, as the connections between the health care and vocational rehabilitation systems that existed in previous times, such as having an on-site rehabilitation counselor, have been severed over the last decade (23). The literature shows that health care professionals do not commonly refer patients for vocational rehabilitation (24). Referral by a health care provider appears to be influential, though, since patients who were referred for vocational rehabilitation were more likely to have a successful outcome (25). Information about each state’s vocational rehabilitation program can be found at www.jan.wvu.edu/SBSES/VOCREHAB.htm.

Government funding for employment support programs such as vocational rehabilitation is quite low in comparison to the funding for disability income support programs (e.g., \$3 billion versus \$80 billion dollars in 1995) (8). Because of low funding, persons who do not

need extensive services may not be eligible for vocational rehabilitation in some state programs. This suggests that the relatively brief intervention tested in this trial may not be available in those states, even though it is likely to be highly cost effective.

Employers are the other potential source for job retention services. Employers increasingly recognize the benefit of job retention practices (8). However, intervention is generally not triggered unless a disability leave of absence occurs. In addition, only larger employers have a sufficient number of employees to make job retention intervention worthwhile, and in many cases, it is reserved for workers with occupational injuries and illnesses (8). There is only anecdotal evidence of the efficacy of job retention services provided through employers because outcome data are collected only sporadically and the information is considered proprietary in nature (8).

The efficacy of job retention intervention has previously been tested in randomized controlled trials only as a component of supported employment programs serving persons with major psychiatric disorders. In these programs, unemployed persons are placed in competitive jobs and then provided with ongoing support while they work (26). While these programs help participants gain employment (26), short job tenure has been a problem, possibly because of the particular effects of these disorders (27). In a descriptive study involving persons with various impairments who started out unemployed and then received job retention services, once they were placed in a job, 68% of the participants retained their jobs at 2 years after placement versus 50% of those who had previously received only placement services (28).

Attention to job accommodation is a primary component of job retention intervention. In data from the Health and Retirement Study, the provision of job accommodation was found to increase job tenure in the full study sample (29). In a subgroup of workers with musculoskeletal conditions, few received job accommodations; however, receipt of only 1 type of accommodation (getting help to do one's job) protected against job loss (30). Small sample size problems were noted, as well as the fact that only those with the most severe functional limitations were accommodated, and since severe limitation is a strong predictor of job loss, accommodations may have been provided too late to make a difference (30).

To our knowledge, this is the only study to evaluate the efficacy of job retention vocational rehabilitation delivered at the primary level of prevention, i.e.,

prior to health-related unemployment. Our outcome was job losses from all causes because we believe that poor health plays a role in most work cessation among persons with chronic diseases. However, when we examined job losses that were specifically cited as being due to health, the results paralleled those for job loss from all causes. Of the 69 job losses for which there is information, 12 in the experimental group and 21 in the control group were due to health (permanent disability) or arthritis/lupus (temporary unemployment).

Our study was conducted in one area of the US. Although it is an economically diverse area, the effect of economic conditions was not tested, since randomization was stratified by location within the area. All study participants were at some risk for job loss, but none had severe functional limitations. Therefore, the results may not be generalizable to persons living in areas with poor economic conditions or persons who have no risk for job loss or persons who have severe limitations. A more extensive intervention may be required where economic conditions are poor or for persons with severe disability. Persons at no risk may not require intervention.

The intervention was relatively brief. There were, however, previous indications of the effectiveness of 2 components of the intervention: attention to job accommodation and promotion of belief in capacity for employment (11,29). The majority of experimental group participants (86%) thought the total of 3 hours' time was "about right." Two counselors without special expertise in job retention interventions delivered the intervention; however, it's possible that the results would not be generalizable to the intervention as delivered by other counselors.

Future studies should test the effectiveness of the job retention intervention examined in this study upon implementation at the community level. It appears that the intervention would be inexpensive, but the actual cost-effectiveness needs to be assessed. Models for establishing connections between the health care and vocational rehabilitation systems also need to be developed and tested. Government and insurance policymakers should consider the value of early employment-support services for persons at risk for health-related job loss (23).

In conclusion, vocational rehabilitation delivered to patients with rheumatic diseases who were at risk for job loss, but while they were still employed, both delayed job loss and reduced its incidence. Such an intervention has the potential to reduce the high indirect costs as well as the personal impact of rheumatic diseases.

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