ORIGINAL ARTICLE

Prediction of Failure to Retain Work 1 Year After Interdisciplinary Functional Restoration in Occupational Injuries

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ABSTRACT. Brede E, Mayer TG, Gatchel RJ. Prediction of failure to retain work 1 year after interdisciplinary functional restoration in occupational injuries. Arch Phys Med Rehabil 2012; 93:268-74.

Objective: To identify risk factors for work retention (a patients' ability to both obtain and retain employment) at 1 year after treatment for a chronic disabling occupational musculoskeletal disorder (CDOMD).

Design: Prospective cohort study.

Setting: Consecutive patients undergoing interdisciplinary functional restoration treatment in a regional rehabilitation referral center.

Participants: A sample of 1850 consecutive CDOMD patients, who were admitted to and completed a functional restoration program, were subsequently classified as work retention or nonwork retention at a 1-year posttreatment evaluation.

Interventions: Not applicable.

Main Outcome Measures: Measures, including medical evaluations, demographic and occupational data, psychosocial diagnostic evaluation, and validated measures of pain, disability, and depressive symptoms, were obtained at admission to, and discharge from, the program.

Results: Using a multivariate logistic regression analysis, the following variables were found to be significant predictors of failure to retain work: older age (odds ratio [OR]=1.84; 95% confidence interval [CI], 1.33–2.54), female sex (OR=1.46; 95% CI, 1.09–1.94), nonworking status at discharge (OR=1.65; 95% CI, 1.11–2.45), extreme disability at admission (OR=1.46; 95% CI, 1.06–2.00), antisocial personality disorder (OR=2.11; 95% CI, 1.09–4.08), receipt of government disability benefits at admission (OR=2.28; 95% CI, 1.06–4.89), and dependence on opiate pain medications (OR=1.43; 95% CI, 1.02–2.00). The final model improved prediction by 75% over assigning all patients to the larger (work retention) group.

Conclusions: This study identified demographic, psychosocial, and occupational factors that were predictive of failure to retain work. These risk factors may be used to individualize treatment plans for CDOMD patients in order to provide optimal functional restoration.

Key Words: Disability evaluation; Pain; Rehabilitation; Risk factors.

OCCUPATIONAL INJURIES are a frequent cause of disability in the workplace. Although most patients with an occupational injury return to work within a few weeks, about 7% of patients will progress into chronic disability, exceeding 6 months. These patients account for the majority of health care costs associated with occupational injury.[1] Many treatment programs have been developed to treat chronic disabling occupational musculoskeletal disorders (CDOMD) in state and federal workers' compensation jurisdictions, the most successful of these being functional restoration.[2,3] Between 82% and 87% of patients completing functional restoration will successfully return to work.[2-4] However, about 3% to 16% of those patients are no longer working 1-year posttreatment,[5] having achieved work return, but not work retention, with both outcomes of importance for societal productivity.

Very few studies have addressed work retention directly. Campello et al[6] examined the number of days patients remained on the job after functional restoration treatment. Any work loss exceeding 3 consecutive days or 5 days in a 12-month period was defined as failure to retain work. The researchers identified 3 variables that significantly predicted work retention: high levels of somatization or obsessive-compulsive symptoms at pretreatment or impaired trunk flexion at posttreatment. However, this study has significant limitations. It only considered nonspecific low back pain, and the most severely affected patients (those with prior surgery, severe depression, and those who did not return to work immediately after treatment) were excluded from the study.

Other studies have examined work retention as a secondary outcome of functional restoration treatment. In these studies, work retention is defined as the ability to maintain employment throughout the postrehabilitation follow-up interval. Injury specific risk factors for failure to retain work included recurrence of injury to the same anatomical area[7] and longer length

List of Abbreviations

BDI	Beck Depression Inventory
CDOMD	chronic disabling occupational musculoskeletal disorders
MVAS	million visual analog scale
NWR	nonwork retention
PRE	pretreatment (program admission)
POST	posttreatment (program discharge)
SSDI	Social Security Disability Insurance
SSI	Supplemental Security Income
WR	work retention
VAS	visual analog scale

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of disability, the time between injury and treatment.[4] In addition, pretreatment surgery was found to be a risk factor for failure to retain work in some studies.[8] However, other similar studies found that spinal discectomy surgery, but not lumbar fusion surgery, was related to work retention,[9] and cervical spine surgery was not a risk factor for lack of work retention.[10]

A variety of other risk factors for failure to retain work have also been examined. These include some demographic factors, such as older age.[8,11] However, other demographic variables, such as marital status and female sex, were shown to be unrelated to work retention.[8,12] Socioeconomic factors, such as presenteeism,[13] working at least 20% of the time postinjury and working at least 3 months postinjury, and treatment-related factors, such as completion of the treatment program,[14] were found to be predictive of successful work retention. Psychosocial risk factors for work retention after functional restoration included pain and disability self-report measures[5,15-17] as well as certain psychiatric conditions[18] and a history of early childhood abuse.[19] One of the most significant risk factors for lack of work retention was the use, abuse, or high dosage of opiate pain medications.[18,20,21]

What is noticeable about these findings is that risk factors for work retention after CDOMD are rarely considered in combination with each other. In addition, occupational factors, such as government disability benefits and availability of the patient's original job and measures collected at posttreatment, are usually not considered. An explicit examination of the factors that predict work retention in CDOMD patients after functional restoration has not yet been conducted.

It should also be noted that it is important to evaluate treatment success or failure using objective outcomes. Many studies only use self-report measures of pain and disability, which are not always reliable indicators of functional status posttreatment.[22-25] Some studies more appropriately used socioeconomic measures, such as return-to-work, that are highly relevant in the workers' compensation setting due to the fact that all patients had to be working prior to their injury claim, and are temporarily paid for disability while they recover. For this reason, return-to-work is often considered the most objective outcome in this population. However, return-to-work may be followed by a number of recurrent episodes of disability, suggesting work retention over time may be even more objective.[7,26] For the purposes of the present study, we chose to examine work retention, which is defined as employment at 1 year after discharge from treatment, regardless of the duration of postrehabilitation employment. The major goal of this study was to examine psychosocial, economic, physical, and occupational factors to identify the combination of characteristics that best predicts whether patients will or will not retain work at 1 year after discharge from a functional restoration program.

METHODS

Participants

Participants for this study were 1850 consecutive patients who were referred to a regional rehabilitation center after an occupational musculoskeletal injury, who consented to the treatment program. Because the data collected were part of the patients' standard medical record, this study was granted an exemption from review by the institutional review board. Health Insurance Portability and Accountability Act (HIPAA) consents were signed by all patients. Patients had all been disabled as a result of their injury for at least 4 months and all completed the treatment program. Table 1 presents the demographic characteristics of the participants. There were 15.7% working at admission to the program, though only 3.7% were working at full-duty. In addition, 43.5% of the patients had received surgical treatment for their injury prior to admission to the treatment program. Patients were compared in 2 groups at the 1-year follow-up evaluation: work retention (WR), working at follow-up, and nonwork retention (NWR), not working at follow-up. Both patients who returned to work after discharge but did not maintain employment at the 1-year evaluation and patients who did not return to work at any point in the year after discharge were included in the NWR group.

Procedure

Functional restoration is a biopsychosocial approach to rehabilitation of musculoskeletal disorders that simultaneously addresses the many problems that accompany a CDOMD.[2,3,27,28] Patients received a complete intake assess-

Table 1: Demographic Characteristics

Variable	WR Group (n=1486; 80.3%)	NWR Group (n=364; 19.7%)	All Patients (N=1850)	*P*
Age	45.5±9.4	49.3±8.7	45.9±9.4	.000
Sex (% male)	54.3	45.9	52.7	.004
Race (%)				
White	51.6	54.9	52.2	NS
Black	24.0	26.9	24.6	
Hispanic	22.2	15.9	21.0	
Asian	1.6	1.4	1.6	
Other	0.6	0.9	0.6	
Length of disability (mo)	18.8±23.0	22.7±25.0	19.6±23.5	.004
Area of injury (%)				NS
Cervical only	3.6	4.1	3.7	
Thoracic/lumbar	34.6	32.3	34.2	
Extremity only	26.6	25.4	26.3	
Multiple spinal	11.3	14.6	12.0	
Multiple musculoskeletal	20.5	19.9	20.4	
Pretreatment surgery n (%)	617 (42.2)	175 (48.7)	792 (43.5)	.026

NOTE: Values are mean ± SD or as otherwise indicated.
Abbreviation: NS, not significant.