The role of job strain on return to work after carpal tunnel surgery

D Gimeno, B C Amick III, R V Habeck, J Ossmann, J N Katz

Aims: To examine the impact of job strain (that is, high psychological job demands and low job control) on return to work and work role functioning at two months, six months, or both, following carpal tunnel release surgery.

Methods: A community based cohort of carpal tunnel syndrome (CTS) patients from physician practices was recruited between April 1997 and October 1998 throughout Maine (USA). 128 patients at two months and 122 at six months completed all relevant questions. A three level outcome variable indicated whether patients had: (1) returned to work functioning successfully, (2) returned to work functioning with limitations, or (3) not returned to work for health reasons. Two job strain measures were created: one, by combining psychological job demands and job control; and two, by dividing demands by control. Ordinal logistic regression was used to identify predictors of the three level work outcome variable.

Results: After adjustment, workers with high demands and high control (active work) were less likely to successfully return to work (OR = 0.22; p = 0.014) at two months. Having a job with higher demands than job control (high strain) predicted not returning to work or returning to work but not successfully meeting job demands (OR = 0.14; p = 0.001), at six months.

Conclusions: The findings underscore the role of psychosocial work conditions, as defined by the Karasek demand-control model, in explaining a worker’s return to work. Clinicians, researchers, and employers should consider a multidimensional and integrative model of successful work role functioning upon return to work. Moreover, since the evidence of the effects of work process changes on the reduction of CTS is very scarce, these findings point to the opportunity for collaborative workplace interventions to facilitate successful return to work.

Carpal tunnel syndrome (CTS), an entrapment neuropathy of the median nerve in the wrist, is one of the most prevalent upper extremity musculoskeletal conditions.1 2 The median nerve passes into the hand through the carpal tunnel, which is bound anteriorly by the tough carpal ligament and posteriorly by the carpal bone. Along with the median nerve, nine flexor tendons of the fingers traverse the carpal canal. These tendons can become thickened from inflammation and other processes. The thickened tendons can compress the median nerve, giving rise to symptoms of nerve irritation. These symptoms usually start gradually and include pain, weakness, burning, tingling, or numbness in the fingers, occasionally also involving the palm and rarely radiating up the arm. Symptoms may make it difficult to perform manual tasks, such as forming a fist or grasping small objects.3

Medical costs related to CTS exceed $1 billion per year with over 250 000 carpal tunnel release surgical procedures performed annually in the USA.4 Because it has been estimated that 50% of all CTS cases may be work related, CTS and carpal tunnel release surgery may have considerable impact on work productivity. Non-surgical treatments such as local corticosteroid injection,5 oral steroids, splinting, ultrasound, yoga, and carpal bone mobilisation6 have shown short term benefits (2–8 weeks). However, surgery tends to provide the most reliable and lasting relief in people with moderate to severe symptoms.7 Compared with other treatment modalities, carpal tunnel release surgery is associated with an earlier return to work and symptom reduction is expected in 70–90% of all carpal tunnel release cases.2 8–11 The worker’s compensation costs associated with CTS are higher than those associated with other musculoskeletal injuries12 as reflected in longer duration away from work and higher medical costs. The rising number of service sector jobs typically involving upper extremity-intensive tasks may increase the number of workers at high risk of developing CTS, and thus, incidence and costs may increase.13 14

In order to design workplace interventions that reduce CTS related work disability, the full range of factors involved in the return to work process must be identified.15–17 The return to work literature has identified a broad range of clinical, personal, economic, legal, and work related factors important in reducing CTS related work disability.18–22 Prospective studies considering CTS specific populations have similarly found clinical, economic, legal, psychosocial, work related physical demands and organisational policies and practices critical in reducing work absence, time until return to work, and improved work role functioning.23–26 Despite their recognised importance in predicting a range of health outcomes,27 fewer studies have considered psychosocial work conditions among CTS workers.

The Karasek demand-control model is a widely used paradigm for conceptualising and measuring psychosocial work stress factors relevant to the design of workplace based interventions.28 Psychosocial job demands, job control, and their combination have been associated with sickness absence;29–31 however, only limited cross sectional32 33 and prospective34 35 evidence exists regarding their impact on return to work. The populations investigated were long term sick listed employees,33 workers with low back injury,35 and only three were conducted among workers with CTS.24 25 32 One investigated the combination of high psychological job demands and low job control on work status changes following CTS diagnosis.24 The other two examined the...
independent effects of high psychosocial job demands and 
low job control on return to work among workers undergoing 
carpal tunnel release surgery, one retrospectively and 
one prospectively. Further, studies indicate that it is often 
eroneously assumed that returning to work implies successful 
work role functioning. Except for one case, outcomes in 
the studies examining the role of the demand-control 
model did not consider worker's functional status upon 
returning to work.

The only previous study examining work role functioning 
upon returning to work after CTS surgery was conducted 
using the same cohort as the present study. Psychosocial job 
demands and job control were explored separately and no 
significant effects were found. The present work extends the 
earlier work with the same cohort by explicitly testing the combined effect of the psychosocial job demands and job 
control as specified by the Karasek demand-control model. 
The present study hypothesises that, adjusted for potential 
confounders, the combination of negative psychosocial job 
demands and job control reduce the likelihood of return to 
work or functioning successfully in the work role upon return 
to work at two months, six months, or both, following carpal 
tunnel release surgery.

METHODS
Participants and study sample
A community based study was conducted in Maine to recruit 
CTS patients from 15 physician practices who performed 
carpal tunnel release (orthopaedics, plastic surgery, and 
neurosurgery). Patient eligibility criteria included: physician 
diagnostic impression of CTS, symptoms of numbness or 
tingling in at least two of the first four fingers for at least one 
month, confirmed diagnosis with nerve conduction testing, 
having been scheduled for carpal tunnel release, and working 
at least 20 hours per week at the time symptoms developed. 
Patients aged under 18 years old, with previous carpal tunnel 
release surgery, pregnant, retired, or full time students were 
excluded. Both the Brigham and Women's Hospital and the 
University of Texas Health Science Center Institutional 
Review Boards approved the study protocol.

Eligible patients (n = 241) were approached and recruited 
consecutively by participating practices between April 1997 
and October 1998. In the present study, questionnaires were 
mailed to consenting patients before and two, six, and 
data were dropped before analysis, comparisons 
were not. In fact, numbers were very small, with 1–2% of 
patients who returned to work after two or six months 
following carpal tunnel surgery were asked to complete a 
subset of 15 questions derived from a 26 item measure of 
work role functioning. Because of the length and complexity 
of the questionnaire and the desire to measure work 
limitations at multiple time points, the researchers shortened 
the instrument following two criteria. First, conceptually, 
surgery was expected to primarily impact the physical and 
output demands' subscales of work role functioning. Given 
the desire to have a work role functioning measure responsive to change, more items from these subscales were 
selected. Second, items with the highest item-to-scale 
correlation and those that when dropped would significantly 
reduce the scales' internal consistency were selected. The 
final 15 items selected (r = 0.91) represents five work 
absences, physical and psychological job demands, job control, 
family and job social support, and organisational policies and 
practices. In the reduced sample there was a slightly greater 
proportion of obese (BMI>30) workers (47%) than the 
analytic samples (both about 40%). A table showing the comparisons is available from the first author.

Because patients were recruited through physician practices, a selection effect could have been present. Although the 
small sample limited analyses of physician practices as a 
random effect, no significant variability between patients 
from different physician practices was found in another analysis of the cohort where work absence was the outcome.

Work role functioning
Patients confirmed whether they were working or not at each 
time point (baseline and two and six months post surgery). 
Patients who returned to work after two or six months 
following carpal tunnel surgery were asked to complete a 
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random effect, no significant variability between patients 
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functioning was not computed for patients not working due to health problems (that is, unable to function in the work role). However, because not working is the most extreme form of unsuccessful work role functioning and the six month work role functioning measure was positively skewed (mean 90; standard deviation 13; range 32–100), a three level outcome variable was created to indicate whether patients: (1) had returned to work and were functioning successfully (able to meet the job demands at least 90% of the time), (2) had returned to work but were functioning with limitations (unable to meet the job demands at least 90% of the time), or (3) had not returned to work for health reasons.

Examination of whether and when job changes occurred showed that only three patients at two months and three patients at six months changed employers. Excluding them did not significantly change results. Changes to the work situation due to CTS were reported by 54% of the patients, although a detailed description of the changes was not available. In a preliminary analysis, a variable indicating whether or not job modification occurred was introduced in the regression models but no significant effect on work role functioning was found.

Psychosocial work conditions

Psychosocial work conditions were assessed following the job strain model with a subset of Job Content Questionnaire (JCQ) items (box 2). Given the questionnaire length and complexity and the goal to have multiple time point measurements, the standard 14-item JCQ measure (that is, five items for job psychological demands and nine for job control) was shortened following practical selection criteria. Items with the highest item-to-scale correlation and those that when dropped would significantly reduce the scales’ internal consistency were selected. Six items were selected from the original JCQ measure: three for job psychological demands and three for job control. Two more items were included in the job control scale. The item on “possibility to change tasks because of pain” was selected after the questionnaire was piloted in three focus groups. Karasek (personal communication) suggested the “time for phone call” item to be used in the knowledge economy. Therefore, the final reduced version contained three items to measure psychological job demands (z = 0.72) and five for job control (z = 0.83). No patients reported significant work conditions changes during the study so only baseline measures were used. Scores of psychological job demands and job control were created from summed averages of the rating scale responses that varied from 1 (strongly disagree) to 4 (strongly agree). For the analyses, job demands and job control were dichotomised by their medians, indicating low and high levels for both demands and control. Values equal to the median were classified into the less hazardous exposure level (that is, low demands or high control, respectively).

According to the job strain model, four work states (the Karasek quadrants) were created by cross classifying the dichotomous variables of psychological job demands and job control: high strain (high demands and low control), active (high demands and high control), passive (low demands and low control), and low strain (low demands and high control). In the analyses, low strain served as the reference group. Two main hypotheses were stated. First, the job strain hypothesis states that the most adverse health reactions as well as reduced feelings of mastery and coping effectiveness will occur in a high strain work state compared to a low strain work state. Second, the active learning hypothesis states that learning and psychological growth as well as improved mastery feelings and coping strategies will arise in an active work state compared to a passive work state.

Additionally, to overcome potential problems with bivariate splits potentially leading to type I errors, a second method for classifying job strain was used. A continuous job strain measure was created dividing psychological job demands by job control. Named after the demand-control model’s job strain hypothesis, the job strain quotient distribution was split into quartiles with the bottom quartile

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**Box 1: Work role functioning measure**

<table>
<thead>
<tr>
<th>Physical demands</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Lift, carry, or move objects at work</td>
</tr>
<tr>
<td>• Keep your body in one position longer than 30 minutes at a time</td>
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<tr>
<td>• Bend, twist, or reach</td>
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<tr>
<td>• Use hand operated tools or equipment (such as pen, drill, sander, keyboard, or computer mouse)</td>
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<table>
<thead>
<tr>
<th>Psychological/cognitive demands</th>
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<tbody>
<tr>
<td>• Concentrate on your work</td>
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<tr>
<td>• Remember things having to do with your work</td>
</tr>
<tr>
<td>• Scheduling</td>
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<tr>
<td>• Stick to your work routine or schedule</td>
</tr>
<tr>
<td>• Do your work without needing frequent rests or breaks</td>
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<table>
<thead>
<tr>
<th>Social demands</th>
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<tbody>
<tr>
<td>• Talk with people in person, in meetings, or on the phone</td>
</tr>
<tr>
<td>• Control irritability or anger toward people</td>
</tr>
<tr>
<td>• Help other people get work done</td>
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</table>

<table>
<thead>
<tr>
<th>Output demands</th>
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<tbody>
<tr>
<td>• Do your work without making mistakes</td>
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<tr>
<td>• Satisfy those people who judge your work</td>
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<tr>
<td>• Feel a sense of accomplishment</td>
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<tr>
<td>• Finish all your work</td>
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**Box 2: Psychosocial work conditions measure**

**Psychological job demands**

- Job is very hectic
- Job requires working very hard
- Asked to do an excessive amount of work

**Job control**

- Get to do a variety of different things on my job
- Have a lot of freedom to decide how I do my work
- Have a lot of say about what happens on my job
- Can do other tasks instead if a particular work task is painful or uncomfortable
- Can make a personal telephone call during the work day
Detailed covariates selection procedures are reported elsewhere and organisational support (measured by the SF-36 MHI-5 scale), 46 and having workers’ surgery (that is, at baseline), depression at baseline (measured by the SF-12 physical component score), 47 and self-efficacy change, 48 post surgery were baseline work role functioning, baseline self-efficacy (measuring patients’ confidence in managing symptoms and maintaining activities), 49 self-efficacy change, and organisational support (measuring organisational policies and practices relevant for worker health and safety). Detailed covariates selection procedures are reported elsewhere. 50

Potential covariates
Covariates of successful work role functioning were included based on prior analyses of the relative impact of clinical, worker, family, economic/legal, job, and organisational factors on successful return to work. 25 At two months, selected covariates were: work role functioning before CTS surgery (that is, at baseline), depression at baseline (measured by the SF-36 MHI-5 scale), 46 and having workers’ compensation claim due to CTS. Covariates at six months post surgery were baseline work role functioning, baseline self-efficacy (measuring patients’ confidence in managing symptoms and maintaining activities), 49 self-efficacy change, and organisational support (measuring organisational policies and practices relevant for worker health and safety). Detailed covariates selection procedures are reported elsewhere. 50

Table 1 Baseline psychological job demands, job control, and job strain predictors of return to work at two (n = 128) and six (n = 122) months after carpal tunnel release surgery

<table>
<thead>
<tr>
<th>Variable</th>
<th>Two months</th>
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<th>Six months</th>
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<tbody>
<tr>
<td></td>
<td>Not working</td>
<td>Working with limitations</td>
<td>Working successfully</td>
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<td>Not working</td>
<td>Working with limitations</td>
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<td>Psychological job demands</td>
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<tr>
<td>Low</td>
<td>19 (26.8)</td>
<td>21 (29.6)</td>
<td>31 (43.7)</td>
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<td></td>
<td>10 (15.9)</td>
<td>16 (25.4)</td>
<td>37 (58.7)</td>
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<tr>
<td>High</td>
<td>20 (33.7)</td>
<td>15 (26.8)</td>
<td>21 (37.8)</td>
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<td>9 (15.5)</td>
<td>16 (27.6)</td>
<td>33 (56.9)</td>
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<td>Job control</td>
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<tr>
<td>Low</td>
<td>20 (25.0)</td>
<td>23 (28.1)</td>
<td>37 (46.3)</td>
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<td></td>
<td>4 (5.7)</td>
<td>16 (22.9)</td>
<td>50 (71.4)</td>
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<tr>
<td>High</td>
<td>19 (39.6)</td>
<td>13 (27.1)</td>
<td>16 (33.3)</td>
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<td>15 (28.8)</td>
<td>16 (30.8)</td>
<td>21 (40.4)</td>
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<tr>
<td>Karasek quadrants</td>
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<tr>
<td>Low strain</td>
<td>10 (21.7)</td>
<td>12 (26.1)</td>
<td>24 (52.2)</td>
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<td></td>
<td>3 (7.9)</td>
<td>11 (28.9)</td>
<td>24 (63.2)</td>
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<tr>
<td>Passive</td>
<td>9 (36.0)</td>
<td>9 (36.0)</td>
<td>7 (28.0)</td>
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<td>7 (28.0)</td>
<td>5 (20.0)</td>
<td>13 (52.0)</td>
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<tr>
<td>Active</td>
<td>10 (30.3)</td>
<td>11 (33.3)</td>
<td>12 (36.4)</td>
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<td>1 (3.2)</td>
<td>5 (16.1)</td>
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<tr>
<td>High strain</td>
<td>10 (43.5)</td>
<td>4 (17.4)</td>
<td>9 (39.1)</td>
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<td></td>
<td>8 (29.6)</td>
<td>11 (40.7)</td>
<td>8 (29.6)</td>
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<tr>
<td>Job strain quotient</td>
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<tr>
<td>1st to 3rd quartile</td>
<td>30 (28.3)</td>
<td>31 (29.2)</td>
<td>45 (42.5)</td>
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<td></td>
<td>9 (9.5)</td>
<td>25 (26.3)</td>
<td>61 (64.2)</td>
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<tr>
<td>4th quartile</td>
<td>9 (42.9)</td>
<td>5 (23.8)</td>
<td>7 (33.3)</td>
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<td></td>
<td>10 (38.5)</td>
<td>7 (26.9)</td>
<td>9 (34.6)</td>
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<td>Active learning quotient</td>
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<td>31 (33.0)</td>
<td>28 (29.8)</td>
<td>35 (37.2)</td>
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<td></td>
<td>17 (18.7)</td>
<td>28 (30.8)</td>
<td>46 (50.5)</td>
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<tr>
<td>4th quartile</td>
<td>8 (24.2)</td>
<td>8 (24.2)</td>
<td>17 (51.5)</td>
<td></td>
<td></td>
<td>2 (6.7)</td>
<td>4 (13.3)</td>
<td>24 (80.0)</td>
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<tr>
<td>Total</td>
<td>39 (30.5)</td>
<td>36 (28.1)</td>
<td>53 (41.4)</td>
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<td></td>
<td>19 (15.6)</td>
<td>32 (26.2)</td>
<td>71 (58.2)</td>
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</table>

*Sum across row rather than column.

RESULTS
Two month results
At two months, 70% (n = 89) of the sample was working and 41% (n = 53) was successfully functioning in their jobs (table 1). The average work role functioning score for those working with limitations was 76.8 (SD 13.5) while, for those working successfully, work role functioning was 96.4 (SD 3.2). A greater proportion of workers who had high psychological job demands (36%) and low job control (40%) did not return to work, while the inverse was found for workers returning to work. Using the Karasek quadrants, workers in low strain jobs were more frequently working successfully (52%), whereas workers in high strain jobs were more frequently not working (44%). The job strain quotient showed similar results with 43% in high strain not working. Workers in passive jobs were as likely to not work as work with limitations (36%), with fewer (28%) working successfully. The proportion of workers in active jobs increased across the work role functioning groups: 30% not working, 33% working with limitations, and 36% successfully working 33% and this trend was more obvious using the active learning quotient (24%, 29%, and 52%, respectively).

Thirdly, following Hosmer and Lemeshow, 50 if the OR was significant (p<0.05), the psychosocial work exposure was entered in multivariate ordinal logistic regression analyses together with the selected covariates. Separate models were developed for the two individual psychosocial work exposures and the four combined exposure measures. Two quadrant models were estimated: one with low strain as the reference group and one with passive as the reference group. Two quotient models were also estimated: the job strain and the active learning quotients. The analyses were conducted independently for the two and six months samples. The fit of the models was examined with the McKelvey and Zavonia’s R2, which varied between 0.42 and 0.61. Analyses were performed with STATA/SE version 8.2, which varied between 0.42 and 0.61.
64% (95% CI 0.23 to 1.75). High strain classified using the Karasek quadrants was not significantly associated with return to work (OR = 0.35; 95% CI 0.09 to 1.49), whereas high strain classified with the job strain quotient remained significant (OR = 0.14; 95% CI 0.04 to 0.43). Using the Karasek quadrants, workers in active jobs were more likely to return to work than passive jobs (OR = 4.88; 95% CI 1.41 to 16.95). The active learning quotient showed similar results (OR = 3.84; 95% CI 1.42 to 10.36). However, adjusting for either the baseline work role functioning or organisational support the active work effect diminished and became non-significant (OR = 1.15 for the Karasek quadrants and OR = 1.05 for the active quotient). Further exploration revealed most workers with active jobs (84% by the quadrants and 96% by the quotient) had high organisational support. Adding high baseline work role functioning (>90), percentages increased only to 87% and 100%, respectively.

Covariate effects were significant and consistent across all models in table 2 (data available from the first author). At six months, predictors of return to work and successful work role functioning were baseline work role functioning (ORs from 4.41 to 4.89), and high organisational support (ORs from 4.41 to 4.89).

**DISCUSSION**

The present study has shown, after confounder adjustments, psychosocial work conditions were associated with return to work following carpal tunnel release surgery and functioning successfully after returning to work. In the short term (at two months), workers in active jobs (high psychological demands combined with high job control) were less likely to return to work and perform successfully than those in low strain jobs (low demands and high control). In the longer term (at six months), having a job with relatively higher psychological job demands than job control (high strain) predicted not returning to work or functioning poorly upon return.
Study limitations and strengths

Limitations include the relatively small sample size and the moderately short follow up period. However, the present study did employ a community based sample and a prospective design, with good questionnaire response rates (80% for both at two and six months). The results were adjusted for a set of clinical, legal, and organisational conditions proven to be significant predictors of return to work in prior analysis. Among all these variables, the adjustment for baseline work role functioning makes the results particularly robust.

With regard to potential bias, three selection effects related to economics, physician practices, and analysis must be considered. Firstly, some workers (that is, those unable to afford the CTS surgery) may not have been available for the recruitment. Secondly, the study sample was not population based but community based, including patients from all over Maine from a range of different physician practices. Also, all workers in the sample had surgery, a treatment preferred for people with moderate to severe symptoms while generally recruitment. Secondly, the study sample was not population based but community based, including patients from all over Maine from a range of different physician practices. Also, all workers in the sample had surgery, a treatment preferred for people with moderate to severe symptoms while generally

The other was retrospective, but no effects were found for psychological job demands and job control but not their combined effects were explored. Therefore, the present study adds knowledge regarding the job strain model: the effects of active and high strain work on work role functioning at two and six months post CTS surgery, respectively. It contributes to a small but increasing literature on the role of job strain in secondary prevention.

Psychosocial work exposures measurement

A fundamental question in the psychosocial work research area is how to operationalise the job strain model. The use of two alternative job strain measures is unusual in the psychosocial work exposure literature. No previous return to work and job strain study used the quotient method. The quadrants and the quotient methods derive from the same conceptual foundation (that is, the demand and control imbalance), but both methods did not classify workers into the same work exposure states. About 72% and 67% were jointly classified as active and high strain, respectively. Although there were differences in effect size and significance irrespective of the method, all ORs were in the same direction (less than 1). This was true whether job strain or active learning effects were examined.

When cross classifying workers using the quadrant and quotient methods some ORs change direction. At two months, workers jointly classified as active with both methods were less likely to return to work (OR = 0.24; p = 0.012). Workers classified active only with the quotient method were more likely to return to work (OR = 5.80; p = 0.044), whereas workers classified active only with the quadrants method were less likely to return to work (OR = 0.39; p = 0.129). Further examination of the group classified active only with the quotient method (n = 10) showed that most of them (70%) were classified low strain with the quadrants method and that all of them had not filled a workers’ compensation claim, a significant predictor of successfully returning to work at two months.

At six months, workers jointly classified as high strain were less likely to return to work (OR = 0.13; p = 0.002). Workers classified high strain only with the quadrant method were also less likely to return to work (OR = 0.25; p = 0.241), while workers classified high strain only with the quadrants method were more likely to return to work (OR = 2.22, p = 0.282). However, the quadrant-only effect was not significant and these workers did not show differences in the six month covariates compared to other high strain workers.

In the unadjusted analyses workers in active jobs were more likely to return to work at six months than passive jobs. Once the model was adjusted for organisational support and baseline work role functioning, the relation disappeared. Further exploration revealed most workers with active jobs had both high organisational support and high baseline work role functioning. Although more research is needed, it can be preliminarily concluded that supportive organisations may create “good” jobs and functioning well at work may select workers into the “good” jobs.

Despite the limits of the sample size, these results highlight two issues important in future research. Firstly, referring to an important methodological paper, researchers contend the median split technique used in the quadrants method may cause exposure misclassification increasing the possibility of type I errors which the quotient method may reduce. If so,
Main messages

- Work role functioning is a new measure capturing the impact of health on the ability of the worker to meet work demands and expands our assessment of the return to work process.
- The active learning quotient has been computed for the first time. This is a novel way to consider the active learning hypothesis and the potentially hazardous passive work state.
- In the short term, after carpal tunnel surgery, having a job with high job control combined with high psychological demands (active work) inhibited people from returning to work and performing successfully.
- In the longer term, having a job with relatively higher psychological job demands than job control (high strain work) predicted not returning to work or functioning poorly upon return to work.

The active learning quotient

A new quotient, the active learning quotient, has been computed for the first time. To date, only the computation of the job strain quotient has been reported. A disadvantage of the job strain quotient is the impossibility of looking at passive work conditions found to be equally hazardous to health. The new quotient allows the review of both passive and active job exposures. The active learning quotient is a novel way to consider the active learning hypothesis and the potentially hazardous passive work state.

Time dependence effect

There is an emerging literature on the time dependent nature of work effects and return to work for patients with low back pain. Amick et al discuss in detail the range of time dependent effects for CTS, suggesting individual, medical, and economic factors are negative predictors of return to work at two months, and organisational and medical factors at six months. Job strain also exhibited a time dependency effect.

The job strain model predicts high strain work causes stress-associated health problems. The significant high strain effect at six months but not two months further supports the time dependency of predictors of return to work suggested by Amick. The significant active work effect at two months suggests different psychosocial work states may be more or less important at different time points in the return to work process. As Kristensen suggested, remaining out of work could be viewed as a coping behaviour to avoid or reduce stressful working conditions. Active workers have more control over when and how they do their job (high job control). As a result, they may be more likely to engage in the coping behaviour. Future research would benefit from theoretical and empirical work considering potential multiple links of active and high strain jobs with work role functioning and time dependence of effects.

CONCLUSIONS

In summary, despite the impact of some clinical and economic variables found in previous analyses, the findings of this research underline the importance of considering work related psychosocial conditions in explaining a worker’s return to work. In most of the efforts to return people to work, nearly all the emphasis is placed on physical accommodations, evaluating the physical capacities of the person and the physical demands of the job, hardly ever considering other work conditions. This study showed some psychosocial work conditions inhibited people from returning to work—something rarely seen as a legitimate avenue for the providers and insurers to address. Clinicians, researchers, and employers should consider a multidimensional and integrative model of successful work role functioning upon return to work. Moreover, because the evidence of the effects of work process changes on the reduction of CTS is very scarce, these findings point to the opportunity for collaborative workplace level interventions to facilitate workers successfully returning to work.

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Policy implications

- Productivity loss associated with not returning to work or not being able to meet work demands should encourage providers and insurers to address the health and productivity importance of a hazardous psychosocial work environment.
- Rehabilitation sciences need to incorporate models of the psychosocial work environment into their rehabilitation process.
- Collaborative workplace and labour market level interventions to help workers return to work should be promoted between clinicians and employers.
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Job strain and return to work

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