



Return to Work Following Lower Back Injury: A Systematic Review

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Study Design. Systematic review.

Objectives. To attempt to identify acute predictors of failure to Return-To-Work following a compensable work-related injury.

Summary of Background Data. RTW outcomes for the same medical condition in a compensation environment is significantly influenced by a multitude of non-medical factors. No model exists for predicting RTW outcomes applicable at the time of a worker sustaining a work-related compensable injury.

Methods. Targeted literature search of Occupational Medicine and Clinical journals in conjunction with an internet search using the search engines OVID and ProQuest 5000.

Results. Numerous papers have been published suggesting qualitative associations between various factors and either absenteeism or disability. Very few qualitative studies have been published. Those factors which have been proposed as being predictive of absenteeism are similar to those said to predict disability, with the efficiency of predicting disability being time-dependent (disability being easier to predict at three or six months post injury than at the time of the injury).

Conclusions. There are multiple non-medical factors associated with a delayed RTW following a work-related compensable injury. Time itself is a significant confounder in any studies of return to work outcomes. Further study is needed to better identify the acute predictors of failure to return to work following a work-related, compensable injury.

Key words. review, systematic, lower back pain, return-to-work, acute predictors Non-medical factors influencing outcomes.

Work attendance and absenteeism are linked to many factors in a 'complex person-work-enterprise-society relationship', with the major, though not sole determinant, being disease-related incapacity¹. Absenteeism is associated with other workplace climate factors including staff turnover, productivity, stress claims, industrial climate, workers compensation claims rate, occupational health and safety performance and staff morale.^{2,3}

Workers compensation systems with their origins in the British system focus on recovery of lost income rather than rehabilitation, which has created problems in New South Wales, Australia.⁴ Recently workers compensation systems have been reviewed in several Australian states under the pressure of cost (premium) containment.⁵⁻¹¹

Successful return-to-work (RTW) programs recognize the role of non-medical factors in reducing disability¹², the utilization of multi-dimensional strategies, and early injury management.¹³⁻¹⁹ The observed variations in RTW outcomes cannot be explained purely, or even primarily, with the medical model.²⁰⁻²¹ Outcomes for the same condition vary between countries²² and within the same country for the same condition. In addition to psychosocial and motivational (including secondary gain) issues, occupation,

treatment, the availability of alternate work duties and co-morbid factors all significantly influence RTW outcomes.²³⁻³¹ No simple, robust and generalisable screening tool has however yet emerged to predict chronic pain and disability or long-term incapacity.³²

When a worker suffers from an injury sufficient to cause him or her to remain off work, this event involves multiple stake-holders, with each attaching different significance to this event. Different parties can have different goals. Case managers focus on RTW and Maximal Medical Improvement, attorneys focus on case settlement, employers and carriers tend to focus on case closure.¹⁵ These parties, with their expectations and goals, all create different forces which act upon the injured worker.

The characteristics of the injured worker are thus likely to be different to that same worker pre-injury. New forces which are now acting upon him/her include the medical effects of his/her injury³⁴, his/her being off work³⁵⁻³⁷ being in a compensation system³⁸ and a complex mix of individual and social/economic issues^{39,40}. It is unclear as to whether or not the same factors which influence the worker to go off work are the same factors which influence the worker to remain off work.



Materials and Methods

This research is conducted to find out the factors which determine if and when a worker injured with a back injury will return to work. To answer this question, a targeted literature search of specialist occupational medicine or back related journals was conducted (in particular, SPINE, Occupational Medicine, Journal Occupational and Environmental Medicine, the Australian and New Zealand Journal of Occupational Medicine, and Disability) in conjunction with an internet search. The method involved use of the search engines Proquest 5000 and Ovid, using the keywords 'return to work', 'predictors', 'workers compensation', 'disability', and 'absenteeism'. This was supplemented by a review of the Australian Digital Thesis Program, as well as literature reviews published by the Australasian Faculty of Occupational Medicine. Currently available systems such as workers compensation systems and RTW programs were also explored to analyse the impact of these systems on the injured workers' return to work. Predictors of absenteeism, presenteeism and disability were identified after a thorough literature research to understand which attributes predict injured workers' RTW. After summarizing the attributes, these were compared against current claims forms available from insurance companies. This in turn will allow the researchers to propose an appropriate model, and to validate this through a longitudinal study of injured workers return to work.

Results

Low back pain – LBP - is one specific condition which has been extensively studied., as was therefore chosen as the main focus of the present study.

In patients presenting with acute low back pain there is a poor correlation between clinical signs and symptoms, and between radiological findings and symptoms²⁷⁻³⁰ On clinical grounds alone it is difficult to predict outcomes in the patient presenting with acute low back pain, with there being marked variation between different practitioners' RTW outcomes³² Non-medical factors must therefore play a significant role in determining clinical outcomes, including Return-To-Work.

In workers with LBP, older age and living alone - and more specifically for neck/upper extremity symptoms, living alone and being female - more strongly determined whether subjects with these complaints took sick leave³⁹

The medical diagnosis influences the time to Return-to-Work. For example, the RTW 'Best Practice' Guideline for 'Displacement of (unspecified) intervertebral disc without radiculopathy' (pain below the knee) treated conservatively in a manual worker is 28 days, compared with 35 days if associated with a radiculopathy³³

The literature indicates that back surgery provides the best results where there is pain below the knee, where there is objective evidence of L5 or S1 nerve root compromise and concordant correctible changes on imaging. In other situations there were no positive effects on pain, back function or work status.⁴⁰⁻⁴²

The type of surgery performed also influences the time to Return-to-Work. For a manual worker with Intervertebral disc disorder with radiculopathy³³ the times are 35 days for medical management, 98 days for Laminectomy, and 140 days for Fusion operation. It is probably simplistic to suppose that the explanation for the difference in RTW outcomes between Laminectomy and Fusion is entirely attributable to the Fusion patient's having more severe

disease than the Laminectomy patients. It is also unknown as to whether doctors who perform Laminectomies have different outcome expectations than doctors who perform Fusions. If true, this might account for some of the variance⁴³

For patients who have had a lumbar discectomy for a herniated discs, low educational levels and having a pre-injury job involving heavy manual labour were poor predictors to return to work.⁴⁴ Conversely, being an elite athlete was a good predictor of returning to pre-injury activity levels.⁴⁵

Other predictors of RTW in patients with low back pain included expectations of recovery, radiating pain, previous back surgery, pain intensity, frequent changes of position because of back pain irritability and bad temper, and difficulty sleeping. This results in a classification error rate of about 40%. This compares with the Orebro Musculoskeletal Pain Questionnaire of 20-30% for prediction of recovery of function and 30-50% for prediction of pain recovery.⁴⁶ Patients of the various health care providers seem to have faith in spontaneous recovery similar to that of their health care provider. These differences may frustrate the public and patients who visit more than one provider.⁴⁴ In a study of 78 people with LBP the work subscale of the Fear-Avoidance Beliefs Questionnaire was the strongest predictor of work status (negative likelihood ratio of 0.08 for scores less than 30, positive likelihood ratio of 3.33 for scores greater than 34).⁴⁷ One study of 123 patients with acute low back pain found that age greater than 45 years, smoking, two or more neurologic signs, a high score on psychosocial screening, and high levels of distress were the best prognostic factors of non-recovery at 3 months.⁴⁸

Psychological factors are important. One study found that depression was the best predictor of a person reporting a new episode of low back pain.⁴⁹ The presence of Waddell's signs (non-anatomic responses on physical examination in patients with low back pain⁴⁵) as a predictor on return to work is debated.^{50,51} A study of 55 patients concluded that patients with acute, occupational low back pain exhibiting Waddell's non-organic signs had a four times lengthier time for return to unrestricted, regular work and a greater use of physical therapy and lumbar CT scans.⁵² Waddell himself considers the "Waddell's signs" to be valid if taken in clinical context.⁵³

The injured workers' pre-injury occupation affects the RTW time. A retrospective follow-up (mean duration 12 years) study of 109 patients who had had a lumbar discectomy for a herniated disc demonstrated that 28% still complained of significant back or leg pain. Heavy manual work and low educational levels were negative predictors of a good outcome.⁵⁴ By contrast, another study demonstrated that 90% of elite athletes requiring discectomy for lumbar disc prolapse with radiculopathy returned to a high level of competition.⁴⁴ Farmers and self-employed referents tended to have lower odds of sick leave because of LBP than employed referents after adjustment for psychosocial factors.⁵⁵ The worker's occupation does not however necessarily increase the likelihood of them having an acute low back injury. A survey of 241 blue-collar workers and 209 white-collar workers identified an equal incidence of work related LBP between these two groups (43% and 42%, respectively).⁵⁶ Another study of workers at an assembly line found that their complaints of low back pain were not related to high peak work loads, repetitive lifts or large lifts.⁵⁷

One study found that in middle aged workers, performing heavy work was associated with back injury claims, as was also lower childhood IQ, lower education and less life satisfaction (at work and



at home).⁵⁸ Another study found that back pain was not associated with living alone, higher Body Mass Index, higher levels of education, or smoking.⁵⁹

Receiving workers compensation payments affects return to work outcomes. Even after adjustment for the initial treatment of the sciatica and for other clinical factors, patients who had been receiving Workers' Compensation at baseline were more likely to be receiving disability benefits and were less likely to report relief from symptoms and improvement in quality of life at the time of the four-year follow-up than patients who had not been receiving Workers' Compensation at baseline⁶⁰. Malingering (Frank or Opportunistic) also delays return-to-work.⁶¹

Individual factors linked to which worker will take time off work with their injury include their past absence history, education, personality and the abuse of drugs and alcohol. Health status is only a minor determinant. Gender appears as a moderating factor in the relationship between job satisfaction and absenteeism with different strengths of association evident between the sexes. Other factors include distance from work, the nature of the job and job work-load, and organizational factors such as autonomy, co-worker or supervisory support, job satisfaction, job stress, longer work hours, and the organizational approach to absenteeism. Taking time off work because of an injury is associated with other workplace climate factors including staff turnover, productivity, stress claims, industrial climate, workers compensation claims rate, occupational health and safety performance and staff morale.¹

Age, attorney involvement^{62,63} long hours worked, work overload and pressure (and the effects of these on personal lives), lack of control over work, lack of participation in decision making, poor social support and unclear management/work role have all been identified as critical factors. There was also some evidence that taking time off work after an injury was associated with poor management style.⁶⁴

After controlling for demographic factors (age and gender) labourers who received safety and health training are less likely than non-trained labourers to file for workers compensation. Among workers 16 to 24 years old, training was associated with a 42% [CI 0.35 – 0.95] reduction in claims.⁶⁵ Absenteeism rates varied between different US states, and according to the industry worked.⁶⁶ After adjustment for demographic variables, fatigue, and factors that describe the type of work environment that high psychological job demands, emotional demands, and conflicts with the supervisor and/or colleagues are risk factors for being injured in an occupational accident.⁶⁷

In Sweden, apart from health problems, clear associations with taking time off work with an injury were observed for complaints attributed to heavy, arduous work, and sickness presenteeism. The use of tranquilizers, occurrence of bullying, and the existence of a high total workload from paid and unpaid work were associated with sickness absence in women. In men, the use of alcohol as sedative, anxiety of reorganization, not holding a supervisor position, adverse life events, and divorce were related to sickness absence.⁶⁸ Conflicting results have been reported regarding age and absenteeism with it either being protective,⁶⁹ or associated with increased absenteeism.⁷⁰⁻⁷³ Obesity appears to have a significant positive association with taking time off work.⁹⁰

Working in an environment of labour cutbacks,⁷⁴ or being members of occupational groups whose everyday tasks are to provide care or welfare services or teach or instruct, have a substantially increased risk of being at work when sick.

Once a worker goes off work with back pain, there are many non-medical factors associated with when they will return to work. The authors of one study reviewed 1000 titles and identified the following individual clinical and psychosocial predictors of chronic pain and disability to have strong supporting evidence and to be strong predictors: Age, Psychological distress, job dissatisfaction, duration of sickness absences, not employed, RTW expectations, Financial incentives, and for low back pain only, the clinical history. Strong individual socio-demographic predictors included older age, duration of current benefits, not employed, RTW expectations, financial incentives, local and unemployment rate.⁷⁵

Pain intensity, poor perceptions of general health, depression, fear avoidance, catastrophising, pain behaviour, and ethnicity were intermediate individual clinical and psychosocial predictors. Type of occupation/education, and previous work record were intermediate individual socio-demographic predictors.⁷⁵ A workers occupational classification can however be an unreliable indicator of their true job demands.⁷⁶

Physical demands of work, co-morbidity³³, anxiety, gender, marital status, education, clinical examination, personality, psychological history, stressful life events and alcohol and substance abuse were all poor individual clinical and psychosocial predictors. The medical diagnosis and ethnic background were poor individual socio-demographic predictors.⁷⁵ In Western Australia in 1990, females, particularly married females, were found to have claims which were costlier and of longer duration than males.⁷⁷

Positive worker expectations are associated with better health outcomes,^{26,29,78,79} shorter periods of care, and early return to work,⁸⁰ pre-injury education, mandated vocational rehabilitation and timely provision of services.⁶² After adjustment for gender, age, chronic diseases and overall health risk status the physical activity level of the worker was protective.⁸¹

Workers who blamed co-workers or equipment for their injuries were more likely to resist returning to former work activities than workers who judged themselves responsible for their accidents. In addition those with relatively minor injuries were as much at risk for work-site avoidance as those with more severe injuries. Age, gender, and length of employment with current employer were unrelated to avoidance.⁸²

Discussion

The literature recognises that some but not all of the factors which determine which workers, with which injuries, will be off work for a prolonged period of time after sustaining a work-related injury, are medical. The large degree of variance in time taken to return to work after sustaining a work-related injury for a particular medical diagnosis indicates that there are significant non-medical factors impacting this. Many studies have been conducted in an attempt to characterise which workers are more likely to suffer from a work-related injury, which workers with a particular health condition are more likely to go off work, and once off work, which workers are more likely to stay off work.

The recognition of the importance of non-medical factors in the RTW process is attested to by the emphasis placed on this area in RTW Programs. The influence of the various stake holders (including the worker, their family, their work colleagues, their employer, their treatment providers and their solicitor) is also acknowledged as affecting RTW outcomes.



Specific factors which this study has identified as being potentially associated with RTW outcomes after sustaining a work-related compensable low back injury include medical factors such as: the medical diagnosis, the presence of leg pain, the reported severity of symptoms, sleep disturbance, frequent changes of position because of back pain intensity, two or more neurologic signs, and the treatment given (including surgery or not, and the type of surgery undertaken).

Non-medical factors identified as being potentially associated with poorer RTW outcomes include: low worker educational levels, a pre-injury heavy manual job, older than 45 years, smoking, positive Waddell's signs, less life satisfaction, receiving compensation, workplace climate (including bullying), prior absence history, abuse of drugs and alcohol, long commuting distance to/from work, attorney involvement, long hours worked, work overload and pressure, high unpaid workload (particularly with women), obesity, and blaming others for the injury.

Non-medical factors identified as being potentially associated with better RTW outcomes include; being an elite athlete, self-employed, prior safety and health training, working in an environment of labour cutbacks, the occupational groups of farmers, care or welfare services, teaching (although it is recognised that a worker's occupational classification may be misleading); financial incentives, blaming self for the injury, positive worker expectations (which are influenced by their treatment providers expectations), and discretionary physical activity levels.

Very few of these studies have attempted to determine a causal relationship between those factors which have been proposed as being associated with either better or poor RTW outcomes. Similarly there have been few studies done to attempt to determine the predictive power of associations. A current method of attempting to identify which workers will have a poor RTW outcome is to apply a screening questionnaire (such as Orebro or FAB) at some point after the injury. This method is potentially flawed due to the combined effects of bias (the injured worker is not blinded to the application or implications of the particular screening test), and the confounding effect of the passage of time since the injury. No validated screening tool suitable for application at the time of injury has yet been proposed to predict RTW outcomes in this environment.

Conclusion

Non-medical factors are recognised as playing a significant role in determining RTW outcomes after sustaining a work-related, compensable low back injury. Many medical and non-medical factors have been proposed as being potentially associated with either good or poor RTW outcomes in this environment. There is little evidence to support causal relationships, and/or predictive power. There is currently no validated predictive tool which can be applied at the time of the injury. Further study needs to be undertaken.

Key Points

- There is significant variation in RTW outcomes between individuals with the same compensable work-related injury.
- Non-medical factors have a significant influence on RTW outcomes in work-related compensable LBP.
- There is little evidence to support there being causal relationships and/or predictive power of associations with RTW outcomes with compensable work-related LBP.
- There is no validated predictive tool which can be applied at the time of injury.

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