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Scientific/Clinical Article

A systematic review of prognostic factors for return to work following work-related traumatic hand injury

Qiyun Shi MD, MSc^{a,b,*}, Kathryn Sinden MSc, CK^c, Joy C. MacDermid PT, PhD^{a,b,c}, David Walton PT, PhD^a, Ruby Grewal MD, MSc^b

^a Health & Rehabilitation Sciences, Western University, Elborn College, Room 1014, 1201 Western Road, London, Ontario, Canada N6G 1H1

^b Hand and Upper Limb Centre Clinical Research Laboratory, St. Joseph's Health Centre, 268 Grosvenor St., London, Ontario, Canada N6A 3A8

^c School of Rehabilitation Sciences, McMaster University, Hamilton, Ontario, Canada L8S 4L8

ARTICLE INFO

Article history:

Received 4 March 2013

Received in revised form

4 October 2013

Accepted 13 October 2013

Available online 21 October 2013

Keywords:

Hand injury

Work-related

Trauma

Return to work

Systematic review

ABSTRACT

Study design: Systematic review.

Introduction: Traumatic hand injuries are frequent cause of work related injuries and can result in prolonged durations of time loss from work.

Purpose: To systematically review available evidence to determine which prognostic factors predict return-to-work (RTW) following work-related traumatic hand injuries.

Methods: We searched Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, EMBASE, CINAHL and PsycINFO from 1980 to September 2013 and reference lists of articles. Studies investigating any prognostic factors of RTW after traumatic hand injury were included. Two reviewers performed study selection, assessment of methodological quality and data extraction independently of each other. Identified factors were grouped into conceptual prognostic factor categories.

Results: We assessed 8 studies, which addressed 11 potential prognostic factors (i.e., sociodemographic factors, occupation, work compensation status, treatment related factors, impairment severity, location of injury, etc.). The quality of the studies was low to moderate. Across all included studies, RTW (original or modified work) occurred in over 60% of individuals by 6 months. There was consistent low-moderate quality evidence that individuals with more severe impairments and lower pre-injury income were less likely to RTW, and low-moderate quality evidence that age, gender and level of education had no impact on RTW. Evidence on other commonly cited prognostic factors were limited in the literature.

Conclusion: Impairment severity and lower pre-injury income showed a consistent association with RTW following occupational hand injury, while other factors demonstrated no or variable effects across studies. Additional high-quality studies are warranted toward improving our understanding of the complex factors that mediate RTW following a traumatic work-related hand injury.

Level of evidence: 2a.

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Introduction

Work-related traumatic injuries impose a significant health and economic burden to patients and contribute to lost productivity.¹ An individuals' hand is integral to many work activities and is vulnerable to work-related injuries ranging from 'simple' injuries such as isolated fractures to complex crush injuries. According to Statistics Canada,² approximately 630,000 Canadians suffered a work-related injury in 2003 and nearly 28% of all those injuries were related to the hand.

Return-to-work (RTW) following a work-related injury is a complex process, which is not solely determined by physical readiness. Most countries support implementation of comprehensive rehabilitation programs to facilitate injured workers re-entering the work force. A recently published systematic review focusing on acute orthopedic trauma concluded higher level education, white collar employment, positive self-efficacy, less injury severity and lack of compensation were protective factors for prolonged work disability.³ However, only one study included in this systematic review was related to hand trauma.

To date, there has been no systematic review evaluating the prognostic factors following work-related traumatic hand injuries. Work-related traumatic hand injuries can range from minor cuts/

* Corresponding author.

E-mail addresses: qshi26@uwo.ca, shiqiyun@hotmail.com (Q. Shi).

burns to more serious injuries such as those where the mechanism of injury is typically a crush injury or amputation resulting from a worker–machine interaction. The lack of evidence on factors that predict RTW following traumatic hand injuries, limits health professionals, employers and policymakers from making accurate plans to accommodate the injured worker, or optimizing the use of resources by matching the RTW plan to the individual. Therefore, the aim of this systematic review is to determine which factors affect RTW in individuals with traumatic work-related hand injuries.

Methods

Search strategy and eligibility criteria

A literature search was undertaken to identify studies that assessed potential predictor(s) of RTW following a work-related traumatic hand injury. Five bibliographic databases were searched using standard medical subject headings (MeSH) and text words (search strategy is listed in [Appendix 1](#)). These included: Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library Issue 11, 2012), MEDLINE, EMBASE, CINAHL and PsycINFO from 1980 to September 2013. References from previously retrieved articles and key journals relevant to this topic were hand searched for additional references.

Research articles were eligible if they met the following criteria:

1. The study participants worked in paid employment at the time of the injury, irrespective of type of employment (i.e., self-employed, public sector or private corporation).
2. The injury was work-related or was eligible for management under a worker's compensation program.
3. The injury was limited to the hand(s).
4. The injury was defined as a traumatic work-related injury that involved bones, joints, or muscles.
5. RTW was defined as return to employment (i.e., pre-injury job or modified job).
6. At least one variable was investigated as a potential predictor(s) of RTW.
7. The study design included prospective, retrospective data collection or a cross-sectional design.

We excluded studies addressing populations with atypical employment such as military service and athletes, as the main purpose of this study was to identify factors and barriers that delay or prevent RTW in the general employed population. We also excluded case reports or case series with sample size less than 20 because of the low quality and lack of precision of such

studies. We restricted our selected studies to the English literature.

Study identification and synthesis

Study authors (QS and KS) independently performed the study selection, assessment of methodological quality and data abstraction. Disagreements between raters were resolved by discussion and a third reviewer (JM) was involved if disagreement remained. Structured data extraction forms were used to extract data on the characteristics of individual studies. Information was collected on characteristics of study participants, data resource, type of injury, RTW rate and outcome measures.

Validity assessment

We used a customized assessment tool ([Appendix 2](#)) designed specifically for this prognostic RTW studies. It comprises 13 items addressing the study quality of participant sampling, predictors and outcome measurement, attribution, statistical analysis, and interpretation of results derived from other systematic reviews.^{3–6} Each question was answered “yes,” “no,” or “unclear.” If all items from each domain were scored ‘yes,’ high quality was assigned. If half of response or more items were “yes,” moderate quality was assigned. Otherwise, low quality was assigned. We decided not to calculate a summative score for each paper because we would have missed potentially important information for each item.⁷ Also this approach more accurately reflects the overall quality of the study.⁸ As such, we reported the main quality domain rather than in the overall score.

Results

Studies identified

A total of 8 studies^{9–16} describing 11 prognostic factors were identified ([Table 1](#), [Fig. 1](#)). The most commonly investigated prognostic factors for RTW following a work-related traumatic hand injuries were: age, gender, education, income, pre-injury occupation, work compensation status, treatment related variables, impairment severity of injury, and location of injury. The summary of the methodological ranking for each study is presented in [Table 2](#). Overall, studies had low to moderate quality in sampling and methodology; and moderate to high quality in analysis. Vague descriptions of the target population, lack of blinding to outcome assessor and lack of a validated outcome measure in predicting RTW were the main shortcomings contributing to low study quality. The range of average rate of return to original or modified work after 6 months across 6 studies was

Table 1
Characteristics of studies included in systematic review

| Author (year) | Place of study | Data source | Study design | Sample size | Mean age | Percentage of RTW/time off (%) | Length of follow-up (months) | Outcome definition |
|------------------|----------------|-------------------------------------|----------------------|-------------|----------|--------------------------------|------------------------------|--|
| Skov (1999) | Denmark | Questionnaire | Retrospective cohort | 802 | N/A | 57 | 12 | Duration of time off work |
| Matsuzaki (2009) | Japan | Medical record | Retrospective cohort | 50 | 43 | 62 | 36 | Duration of time off work |
| Cabral (2010) | Brazil | Medical record | Retrospective cohort | 35 | 37 | 85.7 | 36 | Self-reported RTW work |
| Lee (2010) | Taiwan | Medical record | Retrospective cohort | 140 | 42.6 | 71.4 | At least 6 months | Self-reported RTW |
| Chang (2011) | Taiwan | Medical record | Cross-sectional | 96 | 40.2 | 97.8 | Mean: 11.3 | Self-reported RTW with or without job change |
| Chen (2012) | Taiwan | Medical record | Cross-sectional | 120 | 35.7 | N/A | At least 8 months | Duration of time off work |
| Hu (2013) | China | Direct interview | Prospective cohort | 246 | 33 | 78.1 | 8 | Self-reported RTW |
| Roesler (2013) | Australia | Direct interview/ medical record | Prospective cohort | 192 | 35.1 | 84.3 | 3 | Delayed RTW after 12 weeks |

RTW, return-to-work; WCB, workers' compensation board; N/A, not reported.

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