SHORT REPORT

Self-perceived health and return to work following work-related hand injury

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Background

Return to work is an important outcome following traumatic work-related hand injuries. It is unclear how psychosocial factors affect the time to return to work following traumatic work-related hand injury.

Aims

To investigate the relationships between hand injury severity, self-perceived health, demographics and time off work (TOW) following traumatic work-related hand injuries and the influence of psychosocial factors on the readiness of return to work.

Methods

Data from 120 traumatic work-related hand injured patients were gathered. The Modified Hand Injury Severity Score (MHISS) and Short Form Health Survey (SF-36) were used to assess the severity of hand trauma and self-perceived health, respectively. The relationships between MHISS, SF-36, demographics and TOW were analysed by multiple regression analysis.

Results

Mean duration of TOW was 127 days for patients with a mild MHISS, 108 days for a moderate score, 160 days for a severe score and 236 days for those with a major score. A positive correlation between MHISS and duration of TOW was identified. Self-perceived physical functioning was found to have a negative correlation with TOW, whereas self-perceived mental health was positively correlated with TOW.

Conclusions

This study highlights the importance of self-perceived health in considering return to work following traumatic work-related hand injury.

Key words

Return to work; self-perceived health; time off work; work-related hand injuries.

Introduction

Every year ~4000 Taiwanese employees sustain a traumatic work-related disability. Forearm, wrist and hand injuries are the most common anatomical site for these and are a major cause of functional impairment [1]. In terms of patient outcomes, the location and severity of hand and upper limb injury have been related to the degree of functional recovery and return to work rates. Matsuzaki et al. [2] found an increased likelihood of poorer functional recovery with proximal rather than distal injuries, trauma involving multiple digits and complex injuries. In part, Bruyns et al. [3] and Jaquet et al. [4] supported this as they reported that patients with peripheral nerve injuries sustained at forearm level experience substantial functional impairment and work disability.

The Hand Injury Severity Score (HISS) evaluates anatomical components of the hand distal to the carpus. Urso-Baiarda et al. [5] updated the HISS creating the Modified Hand Injury Severity Score (MHISS) to include wrist and forearm assessment. Both assessments are standardized tools that provide quantifiable and comparable measures of hand injury severity. By contrast, patient-rated health can provide a valuable insight to the status of an individual’s mind as well as body [6]. This cross-sectional study aimed to investigate traumatic work-related hand injuries and examine the associations between hand injury severity, self-perceived health, demographics and time off work (TOW).

Methods

Recruitment took place from a plastic and reconstructive rehabilitation centre between 29 March 2008 and 1 September 2009. Subject inclusion comprised those aged
16–60 years with a traumatic work-related forearm, wrist or hand injury. All subjects received hand therapy interventions after injury. Participants were provided with written and verbal trial information so that informed consent for their involvement could be gained. This study was approved by the Ethics Committee of Chang Gung Medical Foundation, Taiwan.

TOW was calculated by summing the number of days from the injury to return to work. The MHISS evaluates anatomical components of the forearm, wrist and hand in four domains known as the ISMN: Integument (skin and nail), Skeletal (bone and ligament), Motor (tendon) and Neural (nerve and vascular). The total scores are converted to four ordinal categories: minor (<20), moderate (21–50), severe (51–100) and major (>100). The participants’ MHISS were calculated using the patient admission notes, operation note, outpatient department records, radiographs and photographs.

The patient administered SF-36 was used to measure self-perceived health. This validated tick-box questionnaire covers eight topic areas known as ‘items’ that include physical functioning (PF), role-physical (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role-emotional (RE) and mental health (MH) [7]. In total, the test contains 36 multiple choice questions from which a score between 0 and 100 is calculated. Demographic data include gender, age, marital status, education level and compensation status. Compensation status was defined if total benefits were above, similar to or less than previous salary.

Data were analysed using SPSS v12.0 software (SPSS Inc., Chicago, IL, USA). A stepwise multiple regression analysis was performed to assess the factors related to TOW. An α level of 0.05 was used to determine statistical significance.

Results

In total, 120 subjects’ data were analysed; this accounted for 28 females and 92 males who had a mean age of 35.7 years (range 17–57, median 35). Table 1 contains demographic details of the study samples. Mean duration of TOW was 127 days for patients with a mild MHISS, 108 days for a moderate score, 160 days for a severe score and 236 days for those with a major score. Self-perceived health was measured by the SF-36, and means and standard deviations for each of the eight scales: PF ($M = 80.4, SD = 12.2$), RP ($M = 21.0, SD = 29.9$), BP ($M = 62.2, SD = 16.1$), GH ($M = 67.4, SD = 19.0$), VT ($M = 60.3, SD = 17.8$), SF ($M = 69.0, SD = 18.7$), RE ($M = 49.3, SD = 39.2$) and MH ($M = 64.7, SD = 15.3$).

For the multiple regression model based on TOW, only three variables remained after stepwise regression analysis, namely MHISS ($\beta = 0.392, P < 0.001$), PF ($\beta = -0.312, P < 0.001$) and MH ($\beta = 0.168, P < 0.05$). Demographic characteristics were not associated with the TOW; $R^2 = 0.301$ and the SE = 146.3. Detailed results of the regression can be found in Table 2.

Discussion

TOW and hand injury severity were found to have a positive correlation in the present study. Patients with more severe forearm, wrist or hand injury compared to those with minor injury took longer to return to work. Individuals with major trauma spent longer in therapeutic treatment and had an increased likelihood of undergoing repeated surgeries, both of which might have affected their TOW outcome. However, it should be recognized that return to work is a multifaceted phenomenon that has been related to general health, pain, physical functioning, role limitation and mental health among other variables [8]. The SF-36 is useful to identify patients’ perceived psychological and physiological well-being and thus effectively plan and prioritize therapeutic intervention [7]. Following data analysis, we found that subjects’ self-perceived physical functioning was negatively correlated to TOW. It was consistent with the results of Atroshi et al. [9] in patients with musculoskeletal disorders. Improving self-perceived physical functioning by hand therapy or early vocational-oriented programmes integrated
with medical and non-medical strategies are probably beneficial to return to work outcomes. Furthermore, it was interesting to find that self-perceived mental health was positively associated with TOW. This result was in contrast to earlier research by Post et al. [8]. Taiwanese policy that enables injured workers to be automatically eligible for up to 2 years compensation may have influenced our patients’ self-perceived mental health. To improve return to work outcomes following a work-related forearm, wrist or hand injury, we stress the need of a comprehensive assessment and a holistic treatment that takes all physical, psychological and social factors into considerations.

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### Conflicts of interest

None declared.

### References


### Table 2. Stepwise selection of variables for multiple regression analysis predicting TOW following traumatic work-related hand injuries

<table>
<thead>
<tr>
<th>Step</th>
<th>Variables</th>
<th>$R$</th>
<th>$R^2$</th>
<th>Adjusted $R^2$</th>
<th>$R^2$ change</th>
<th>$F$</th>
<th>$B$</th>
<th>SE</th>
<th>$\beta$</th>
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<td>1</td>
<td>MHISS</td>
<td>0.459</td>
<td>0.211</td>
<td>0.204</td>
<td>0.211</td>
<td>31.5*</td>
<td>0.280</td>
<td>0.057</td>
<td>0.392</td>
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<tr>
<td>2</td>
<td>PF, RP, BP, GH, VT</td>
<td>0.525</td>
<td>0.276</td>
<td>0.263</td>
<td>0.065</td>
<td>22.3*</td>
<td>−4.426</td>
<td>1.180</td>
<td>0.312</td>
</tr>
<tr>
<td>3</td>
<td>MH, Gender, Age, Marital status, Education level, Compensation status</td>
<td>0.549</td>
<td>0.301</td>
<td>0.283</td>
<td>0.025</td>
<td>16.7*</td>
<td>1.903</td>
<td>0.925</td>
<td>0.168</td>
</tr>
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* $N = 120$.
* $P < 0.05$.

### Key points

- The severity of hand injuries had a positive correlation with time off work.
- Self-perceived health was associated with return to work outcome following traumatic work-related hand injury.
- Self-perceived physical functioning was negatively correlated with time off work, whereas self-perceived mental health was positively correlated with time off work.

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