

## ORIGINAL ARTICLE

# Return to work after spinal cord injury: factors related to time to first job

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**Study design:** Cross-sectional survey.

**Objectives:** To investigate factors related to length of time between spinal cord injury (SCI) onset and start of first post-injury employment.

**Setting:** Persons living with SCI in the community who are members of a disability support organization.

**Methods:** Participants were randomly selected from the membership list of a non-governmental voluntary organization. They met the following four criteria: traumatic SCI, minimum of 15 years of age at the time of survey, a minimum of 2 years after SCI and had been employed for some time since SCI. The main outcome measure was time (in years) from injury onset to beginning first post-injury job.

**Results:** Participants averaged 4.9 years (s.d. 5.1) from the time of SCI to their first post-injury job, with a range of 3 months to 20 years. Fifty percent of the participants who eventually returned to work had done so by 4 years. Return to pre-injury employer and employment were associated with early return, whereas having less years in education and being older at the time of injury were associated with longer time to return to work.

**Conclusion:** Rehabilitation team need to consider return to employment as a realistic goal even many years after SCI. Perhaps a focus on returning more people to their pre-injury employer and employment with added focus and input from rehabilitation team for those with lower education status and older age at time of injury might expedite the process of reintegration.

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**Keywords:** employment; rehabilitation; spinal cord injuries

## Introduction

Employment outcomes are frequently measured in rehabilitation research as an indicator of success in integration after a major disability such as spinal cord injury (SCI).<sup>1,2</sup> However, return to work rates in published literature varies greatly and this is possibly due to different methodologies, definitions of employment and employment rates. Yasuda *et al.*,<sup>3</sup> in a review of studies on return to work published between 1995 and 2001, found rates ranged from 13.8 to 39.3%. Another review by Lidal *et al.*,<sup>4</sup> for studies published between 2000 and 2006, reported a rate between 21.0 and 67.0% for those working at the time of injury. While another recent review of studies published between 1992 and 2005 concluded that ~40% of working age people >12 months post-injury were employed at the time of data collection.<sup>5</sup>

It is generally accepted that there are other important vocational outcomes after SCI besides return to work rates,

such as time between onset of SCI and start of employment.<sup>5,6</sup> Employment outcome such as return rates, also seem to improve with increasing time since SCI. A study involving a large hospital-based sample found that 77% of the participants who eventually returned to work had done so by 5 years post-injury, and 93% had done so by 10 years post-injury.<sup>6</sup> Another study involving data from Spinal Cord Injury Model Centres in the United States found that employment rate increased from 13.8% at the first anniversary of SCI onset to 38.4% at year 15 (ref. 7).

Often the question is asked, how soon after a major disabling condition (such as spinal cord injury) is it too soon or premature to discuss and plan return to work. There are few studies that have looked into the amount of time taken to return to work and the factors associated with them. Berkowitz examined time until employment for individuals with SCI among a sample of 500 participants, reporting that it took an average of 3.8 years to return to gainful employment. A shorter time until employment was predicted by higher levels of education, fewer needs for assistance, having used a computer in pre-injury work and driving a modified vehicle.<sup>8</sup> Krause<sup>9</sup> in a study involving participants with

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a minimum of 15 years after injury found an average of 4.8 years to first post-injury job and 6.3 years until their first full-time job, and the fast track to employment was defined by either returning to the pre-injury job or having worked at a professional job pre-injury.

In Malaysia, barriers experienced by people with disabilities, especially with regard to access issues and ineffective enforcement of prodisability legislations, might potentially interfere with work resettlement. However, being a newly industrialized nation with a robust economy and generally low unemployment rate in the last decade,<sup>10</sup> it is also probable that employment outcomes may not differ significantly from developed nations.

#### Purpose

The purpose of this study was to identify factors associated with the number of years between SCI onset and return to work. Understanding how long it takes to return to work and the factors related to it will help rehabilitation professionals in assessing individual's ability to return to work, vocational planning and realistic goal setting. The focus of this study was on demographic, injury-related, educational and pre-injury employment status.

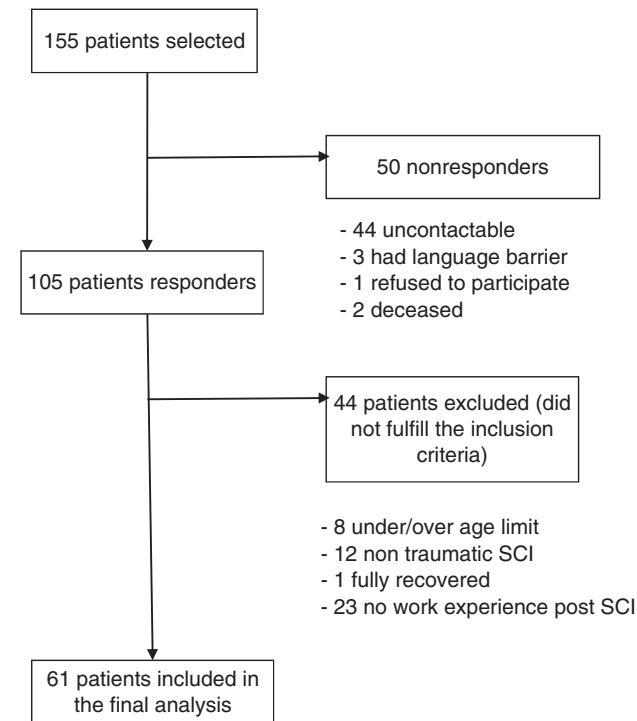
## Materials and methods

### Participants and procedures

Participants were randomly selected from the membership list of a non-governmental voluntary organization for people living with SCI in Malaysia. It was chosen for sampling as it had a large number of members (306 at the time of this study) of various age, education and racial background from almost all the different states in Malaysia (rural and urban areas). On the other hand, the databases from the two major urban hospitals in Malaysia with SCI rehabilitation units, University Malaya Medical Center and Hospital Kuala Lumpur were incomplete. There were four inclusion criteria: traumatic SCI, a minimum of 2 years after SCI, minimum age of 15 years at the time of study and had been employed for some time since SCI. The minimum age of 15 was chosen based on Malaysian Department of Statistics definition of economically active population.<sup>11</sup> Out of 155 persons randomly selected, there were 50 (32.2%) non-responders, and out of the 105 persons who were interviewed through phone, only 61 participants fulfilled all the study criteria and were used in the final analysis, as shown in the flowchart in Figure 1. Approval to conduct this study was obtained from the Ethics Committee of University Malaya Medical Center, Malaysia.

### Measures

A questionnaire was designed, taking into consideration the objectives of this study. The main outcome variable was years to first post-injury employment. The definition of employment was in accordance with the resolution concerning statistics of the economically active population, adopted by the 13th International Conference of Labour Statisticians



**Figure 1** Shows the flow of study participants from selection to study participation.

(Geneva 1982),<sup>12</sup> whereby both paid employment and self-employment were considered as participation in employment. Students, homemakers and those in training (not within a job contract) are not counted as in employment. Employment-related variables include working status before SCI, return to the same job and same employer post-SCI and receiving financial compensation. Demographic and injury-related variables include age at injury, gender, injury severity and ability to drive a modified vehicle, either a modified hand-controlled car or three wheeled hand-controlled motorcycle. Injury severity was classified as paraplegia and tetraplegia. As this study was based on self-reported data, the International Standards for Neurological Classification of SCI by the American Spinal Injury Association (ASIA) could not be followed to determine the neurological level or completeness of the injury. Participants were interviewed as to whether they have weakness in the legs only (paraplegia) or involving the upper extremities as well (tetraplegia). Education status was measured by the number of years of study both at the time of SCI and at the time of survey.

### Analyses

Basic *t*-tests and Pearson's correlations were used to identify the association between the independent variables and outcome variables. The *t*-tests were used with dichotomous-independent variables (for example, injury severity), whereas Pearson's correlations were used with metric-independent variables (for example, age of injury onset). The *P*-value of <0.05 was considered significant.

## Results

### Participant characteristics

The mean age at the time of injury was 24.5 years (s.d. = 8.3). The mean age at the time of study was 40.2 (s.d. = 10.4). The mean years since injury in this study was 15.7 years (s.d. = 8.3). The average number of years of education at the time of injury was 9.6 years (s.d. = 3.7), only 12 persons (19.7%) had obtained tertiary education: diploma, graduate and postgraduate levels (more than 12 years of study).

### Employment characteristics

Most of the participants were working at the time of injury (72.1%) and all were in full-time employment and very few (9.1%) were self-employed. For the purposes of this study, all the participants ( $n=61$ ) must have had some work experience post-SCI. At the time of survey 48 (78.7%) were still in employment, and out of this 27.1% were in part-time employment and majority (64.6%) were self-employed. Out of this also, only eight participants returned to the same employer and only seven returned to their pre-injury job.

### Time to first employment

The average time until first job in this study was 4.9 years (s.d. = 5.1), with the range of 3 months to 20 years. Fifty percent of the participants who eventually returned to work had done so by 4 years post-injury and 90% by 10 years, as shown in Figure 2.

### Factors associated with time to first employment

Only two employment-related factors were significantly associated with time until first job, as shown in Table 1. Return to pre-injury job and employer were the only variables significantly associated with early return ( $P<0.01$ ).

Other factors related to length of time between injury onset and start of first post-injury employment that were examined include years of education before injury, years of education at time of study, age at injury and age at time of

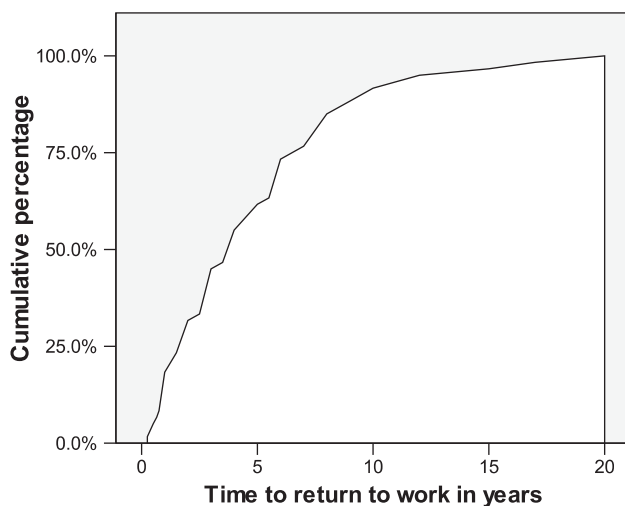


Figure 2 Shows cumulative percentage of employed participants as a function of time (in years) taken to return to work post-SCI.

study. Only two variables correlated significantly with the study's outcome variable. Years of education before injury and chronologic age at injury onset, both correlated negatively with years to first job ( $r=-0.19$ ,  $P=0.05$  and  $r=-0.21$ ,  $P=0.02$ , respectively). There were no correlation between years of education at the time of the study and years to first job ( $r=-0.17$ ,  $P=0.07$ ) and similarly, age at the time of the study with years to first job ( $r=-0.08$ ,  $P=0.37$ ).

## Discussion

This study has yielded a rather similar mean duration of time (4.9 years) to return to work compared with other studies. Krause,<sup>9</sup> in a recent study, found that time to first employment averaged 4.8 years; however, time to first full-time employment had a longer mean of 6.3 years. In this study, we did not investigate time to first full-time job; however, majority (72.9%) of those who returned to employment, returned to full-time employment. In another study involving participants with an average of 14.8 years having passed since SCI onset, time to first employment averaged 3.9 years, whereas first full-time employment was 4.3 years.<sup>6</sup>

The average time taken to return to employment should be taken into consideration with other factors, such as need for

Table 1 Factors related to length of time between injury onset and start of first post-injury employment

Variables	Mean time to work		
	Years (s.d.)	$t^a$	P-value
<b>Gender</b>			
Male	5.2 (3.7)	0.524	0.612
Female	4.1 (6.0)		
<b>Injury severity</b>			
Paraplegia	4.6 (3.7)	-1.272	0.225
Tetraplegia	6.7 (5.5)		
<b>Financial incentive</b>			
Yes	5.3 (4.6)	1.156	0.253
No	4.2 (2.9)		
<b>Ability to drive</b>			
Yes	4.8 (4.0)	-0.343	0.733
No	5.2 (4.5)		
<b>Employed at injury time</b>			
Yes	5.1 (3.9)	0.405	0.689
No	4.6 (4.9)		
<b>Work experience before injury</b>			
Yes	4.9 (3.8)	-0.310	0.761
No	5.4 (5.4)		
<b>Return to same employer</b>			
Yes	1.9 (1.7)	-4.225	0.000
No	5.5 (3.8)		
<b>Return to same job</b>			
Yes	2.1 (1.8)	-3.639	0.002
No	5.4 (3.8)		

<sup>a</sup>Equal variances not assumed.

further training or education, as well as other potential confounding factors such as psychological readiness and type of occupation, which were not examined in this study. In situations where one is attempting to predict length of time to return to work or work life expectancy, such as in cases of litigation and life care planning, it is reasonable to assume that majority will do so on average by 5 years post-injury keeping in mind the wide range as found in this study, whereby some take as short as 3 months, whereas others as long as 20 years.

Several factors were related to the interval between SCI onset and time to return to work. First, having the opportunity to return to pre-injury employer and employment were associated with almost 3 years (earlier) time difference with those who did not have this opportunity. This is similar to previous studies<sup>6,9</sup> that also found this path to work faster and therefore the recommendation that every effort be made by the rehabilitation team to work towards this goal if it is feasible. If this is not possible, the interval of time to work after SCI may be considerably longer.

The finding that having less years in education and being older at the time of injury were associated with longer time to return to work was not unexpected, in that these characteristics have been consistently shown to even affect the likelihood of ever returning to work in the first place.<sup>13–15</sup> Studies that looked into time to return also showed that these factors were negatively related to time<sup>6,9</sup> and the need for rehabilitation professionals to either look into further education or training or other possible measures to expedite work resettlement.

#### Limitations

There are several limitations of the study. First, in terms of generalizability of result, there were small number of participants in important subgroups, such as gender (female = 11), tetraplegia ( $n = 12$ ) and higher education level ( $n = 12$ ). There is also the possibility that members of a non-governmental organization maybe more motivated and therefore not truly representative of people living with SCI in the community. Second, data were self-report with potential for retrospective recall bias and also because the data were cross-sectional, rather than longitudinal, there may be some systematic biases. The ideal design would be to start with a longitudinal cohort at the time of injury. This research also did not look into type of occupation as a variable affecting time to return to work, as it was felt that the types of occupation classification available were either too simplistic for meaningful interpretation or too complex for practical use.

#### Implications

In facilitating post-injury employment, returning to the pre-injury job and employer should be a priority, as this could be a potentially time-limited opportunity. This is in agreement with the conclusion and recommendations of Krause *et al.*,<sup>6,9</sup> whereby the focus should be on, how long is the window open for returning to the pre-injury employer or utilizing the

pre-injury skills. Given the nature, longevity and compensation scheme of a particular job skill or occupation, allowing an individual time to adjust to his/her SCI as is the current practice may inadvertently contribute to closing the window of opportunity for a relatively speedy time to work. On the other hand, the question of 'how soon after SCI is too soon to discuss return to employment' may be moot in a sense that there are too many variables to consider for any given person's level of injury and type of work. It is therefore recommended that perhaps every effort should be made by the rehabilitation team, as soon as possible, to return a person with SCI to his/her former employer and employment.

#### Conflict of interest

The authors declare no conflict of interest.

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