

The impact of impairment, socio-demographic and environmental factors on spinal cord injury survivors' ability to return to work

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Abstract

BACKGROUND: Re-employment of spinal cord injury survivors (SCIS) has been positively related to better community integration. The identification of the determining factors and their impact on return to work (RTW) of SCIS would be helpful in improving the RTW rate.

OBJECTIVE: The aim of this study was to identify the factors determining RTW and explore their impact on RTW.

METHODS: An adapted Work Rehabilitation Questionnaire Self-Report questionnaire was used to elicit sociodemographic information and work-related characteristics of the participants. Sixty-eight participants with a pre-morbid worker status completed the questionnaires which were sent via mail, email and hand delivery. Descriptive and inferential statistical analyses were performed.

RESULTS: At the time of the survey 70.6% of the participants were not re-employed. The inferential statistical analysis indicated that time since injury and re-employment, receiving medical attention due to complications, vocational intervention, supervisor's support, family support and government support were significant factors of RTW. The results showed no significant differences in RTW by most of the sociodemographic factors. Only two percent of the participants indicated vocational planning and intentions.

CONCLUSION: The significant impact of vocational and injury characteristics suggests that vocational rehabilitation services are urgently needed to support SCIS in returning to their worker role. Returning to work is a significant outcome of SCI rehabilitation.

Keywords: Employment, spinal cord injury, work, Namibia

1. Introduction

Spinal cord injury (SCI) is one of the most devastating injuries that can occur to a worker. It leads to crucial changes in work, family and the daily life of the injured individual [1]. The employment of spinal cord injury survivors (SCIS) has received much attention as it affects the lives of these individuals and their families. According to Anderson, Krajci and Vogel [2] and Merritt et al. [3], employment has been positively related to better community integration in persons with SCI. Furthermore, many studies confirm earlier findings suggesting that quality of life and life satisfaction in general is better in persons with SCI who are working [4, 5].

Statistics released by the Namibian Statistics Agency [6] indicate that 4.7% (98 000) of the Namibian population is living with one or more disabilities. The proportion of those with SCI has not been determined and there are no statistics on the employment of SCIS. Several studies on the employment of individuals with SCI demonstrated that approximately 30–40% of these individuals participated in the labour market in Western countries [7, 8]. A systematic review by Lidal, Huynh and Biering-Sorensen [9] confirms that there are still ongoing high unemployment rates among individuals with SCI. A number of sociodemographic and environmental factors that influence work reintegration have been identified in that review, and they include education, type of employment, severity of the disability, age, time since injury, gender, marital status and social support, vocational counselling, medical problems, employer's role, race, psychological state, and environment. Most of the studies, however, were conducted in North America and Europe. There is a dearth of studies conducted in African countries including Namibia.

It is not clear how SCIS in Namibia face the socio-demographic and environmental factors and how their impairment impact on their return to work. The aim of this study was to explore and identify the impact of these important factors on returning the SCIS to their worker role. This information has important implications for the SCIS, family, fellow workers, healthcare professionals, supervisors, employers and insurers.

2. Methods

2.1. Study design

The study used a cross sectional survey by utilising an adapted version of the validated Work Rehabilitation Questionnaire Self-Report (WORQ-SR) to determine the impact of impairment, socio demographic and environmental factors on SCIS's ability to return to work (RTW).

2.2. Data collection instrument

The WORQ-SR is a 59 item self-rated standardised instrument that has been developed to better understand the extent of problems in functioning that people may have due to their health condition(s) and who are undergoing work or vocational rehabilitation. The questionnaire identifies and monitors problematic areas of relevance in functioning in an individual undergoing rehabilitation along the whole continuum of RTW process [44]. The WORQ-SR proved to have content validity for utility in patients with SCI within the context of vocational rehabilitation and can be used to assess the functioning and disability of patients in the return to work process [10].

WORQ-SR comprises of two parts, part 1 which consists of 17 items that measure socio-demographic and work related information such as gender, age, marital status, employment status, educational level and return to work status. Part 2, which comprises of a series of questions concerning one's functioning in the past week, was not used. Only part 1 of the WORQ-SR questionnaire was used in this study to obtain information on the socio-demographic and work related characteristics of participants. The questionnaire was adapted by categorising all open-ended questions for easy coding with SPSS analysis software. An additional eight questions were included, which elicited responses on race, date of injury, cause of injury, level of your injury, completeness of injury, associated injuries besides SCI and complications after injury.

2.3. Participants

Out of the 4.7% of persons with disabilities in the 14 regions of Namibia, 50,125 were females while 48,288 were males [6]. Of the four Northern regions, Omusati and Ohangwena regions have the highest number of people with disabilities with 15,230 and 13,279 respectively followed by Oshikoto (12,172) and Oshana (9005) [6]. Khomas (Southern region) has a high number of persons with disabilities (10,713). Participants (SCIS) were recruited by means of a non-probability purposive sampling technique which involves identification and selection of individuals or groups of individuals that are proficient and well-informed with a phenomenon of interest [11]. Participants who met the eligibility criteria were sampled from the rehabilitation departments of the three referral hospitals in the Southern and Northern regions as well as from the Motor Vehicle Accident Fund (MVAf) database. However, some of the participants who were treated at the referral hospitals were originally from other regions, which made the sample a national representation of SCIS.

2.4. Inclusion and exclusion criteria

The eligibility criteria for the participants included:

- Those aged between 18 and 60 years who sustained complete or incomplete injuries of C5 level or below from any cause.
- Those who had a pre-morbid worker status and are preparing to return to work.
- SCIS who were currently working.
- SCIS who had attended rehabilitation before.
- SCIS who had left employment after RTW.
- Those who were able to understand and communicate as well as comprehend English. Although English is the official language of Namibia, with 10 indigenous languages and 30 dialects [12], this made it difficult to conduct forward and back translations.
- The SCIS who are outside the age range of 18–60 years, who suffered a spinal cord injury of a level above C5 and were not working before suffering from SCI were excluded from this study.

2.5. Sample size

The sample size for this study was 68, calculated using the Yamane formula at 95% confidence level and a 0.05 error limit [45].

2.6. Data collection procedure

Questionnaires were sent to the participants via mail, email and hand delivery. A request for the participants to recommend other people who may be willing to participate in the research accompanied the questionnaire. A follow up was made telephonically for questionnaires which were not returned within two weeks. Of the 42 questionnaires sent via mail and email, 32 were returned. After recording their informed consent telephonically, 25 participants completed the questionnaires over the telephone since they had challenges in writing their responses and mail them back. Eleven questionnaires were hand-delivered and collected physically.

2.7. Data analysis

Data were analysed as frequencies using descriptive statistics with SPSS Statistics Standard version 25. Summary statistics for key independent variables (participation; environmental and personal factors) and dependent variables (return to work) were calculated. Chi-square test (or Fisher-Freeman-Halton tests where data violated chi-square test assumptions) was used to analyse the relationships of the variables and Cramer's V measure was performed to determine the strength of the relationship between the variables [13]. Significance was set at $p < 0.05$.

2.8. Ethical considerations

Ethics approval for this study was granted by the University of Kwazulu Natal Biomedical Research Ethics Committee (Ref no. BE634/17), Motor Vehicle Accident Fund Namibia and the Ministry of Health and Social Services (Ref no. 17/3/3 IC). Written and recorded telephonic informed consent were sought from all participants before completion of the survey questions.

3. Results

3.1. Characteristics of the participants

Most (38.2%) participants' ages were in the age range of 36–45 years at the time of the survey, with male participants constituting the majority (67.6%). Twenty-six percent of men and 36.4% of women were employed whilst 73.5% of the participants had secondary education or lower with a higher employment rate of 41.2% among those with a college education. Twenty-five (36.8%) out of the total 68 participants were married, whilst the others either never married (39.7%), were separated (4.4%), divorced (8.8%), widowed (1.5%) or were co-habiting with a partner (8.8%). Fewer participants indicated their race as coloured (10.3%) and white (1.5%), whilst the rest were blacks (85.3%). There was no significant difference between the participants' personal characteristics and their employment status as shown in Table 1.

Table 1
Descriptive data and correlation between employment and personal characteristics

Characteristic	N (%)	Employed N (%)	Not employed N (%)	Total N (%)	<i>p</i> -value
Age (years)	68				0.171
18–25		3 (75.0)	1 (25.0)	4 (5.9)	
26–35		7 (41.2)	10 (58.8)	17 (25.0)	
36–45		6 (23.1)	20 (76.9)	26 (38.2)	
46–55		3 (21.4)	11 (78.6)	14 (20.6)	
56–60		1 (14.3)	6 (85.7)	7 (10.3)	
Gender	68				0.384
Male		12(26.1)	34 (73.9)	46 (67.6)	
Female		8 (36.4)	14 (63.6)	22 (32.4)	
Marital status	68				0.203
Never married		11 (40.7)	16 (59.3)	27 (39.7)	
Married		6 (24.0)	19 (76.0)	25 (36.8)	
Separated		0 (0)	3 (100)	3 (4.4)	
Divorced		0 (0)	6 (100)	6 (8.8)	
Widowed		0 (0)	1 (100)	1 (1.5)	
Cohabiting		3 (50)	3 (50)	6 (8.8)	
Education	68				0.110
Less than primary school		1 (100)	0 (0)	1 (1.5)	
Primary school		3 (18.8)	13 (81.2)	16 (23.5)	
Secondary school		8 (24.2)	25 (75.8)	33 (48.5)	
College/University		7 (41.2)	10 (58.8)	17 (25.0)	
Post graduate		1 (100)	0 (0)	1 (1.5)	

3.2. Employment and injury characteristics

Table 2 shows the association between employment status and injury characteristics. Whilst the selection criteria for this study included only participants who were employed prior to SCI, at the time of the survey 70.6% were not re-employed. There was a statistically significant association between time since injury and re-employment after injury (0.024) with a strong relationship of the two variables (Cramer's $V = 0.399$).

The selection criterion included participants with complete or incomplete injuries of C5 level or below. Eleven (40.7%) of the individuals whose injury was at thoracic level were employed post injury, while the lowest employment rate of 20.5% was observed among participants who had SCIs at cervical level. Re-employment in relation to level of injury and completeness of injury was statistically insignificant. The return to work rate among participants with complications post-SCI (pressure sores, pneumonia, urinary tract infections and others) was 24% ($p = 0.050$) and 70.1% ($p = 0.012$) of the respondents who were receiving medical/therapeutic treatment were unemployed. The association between employment and receiving medical attention due to complications was highly statistically significant and strong (Cramer's $V > 0.3$).

Motor vehicle accidents were identified as the leading cause of injury (79.4%), with falls, sports and gunshots having caused SCI to two (2.9%) participants each. Other causes were diseases (5.9%) and assault (5.9%).

Table 2
Relationship between employment and injury characteristics

Characteristic	N (%)	Employed N (%)	Not employed N (%)	Total N (%)	p-value	Cramer V
Time since injury	66				0.024	0.399
<1 year		0 (0.0)	1 (100)	1 (1.5)		
2-4 years		9 (37.5)	15 (62.5)	24 (36.4)		
5-7 years		2 (12.5)	14 (87.5)	16 (24.2)		
8-9 years		0 (0.0)	9 (100)	9 (13.6)		
>10 years		8 (50.0)	8 (50.5)	16 (24.2)		
Level of injury	68				0.168	
Cervical		8 (20.5)	31 (79.5)	39 (57.4)		
Thoracic		11 (40.7)	16 (59.3)	27 (39.7)		
Lumbar		1 (50.0)	1 (50.0)	2 (2.9)		
Completeness of injury	68				0.455	
Complete		14 (32.6)	29 (67.4)	43 (63.2)		
Incomplete		6 (24.0)	19 (76.0)	25 (36.8)		
Complications	50				0.050	0.396
Pressure sores		4 (26.7)	11 (73.3)	15 (30.0)		
Urinary tract infections		6 (20.7)	23 (79.3)	29 (58.0)		
Pneumonia		0 (0.0)	4 (100)	4 (8.0)		
Others		2 (100)	0 (0.0)	2 (4.0)		
Medical/therapeutic treatment	67				0.012	0.306
Yes		8 (19.0)	34 (81.0)	42 (62.7)		
No		12 (48.0)	13 (52.0)	25 (37.3)		

3.3. Current employment and vocational characteristics

Return to work after SCI was significantly associated with and strongly related to some vocational intervention ($p = 0.009$, Cramer's $V = 0.389$), supervisor's support ($p = 0.001$, Cramer's $V = 1.000$) and government support ($p = 0.010$, Cramer's $V = 0.608$). Out of the 60 participants who responded to receiving family support, 26.7% of them were employed.

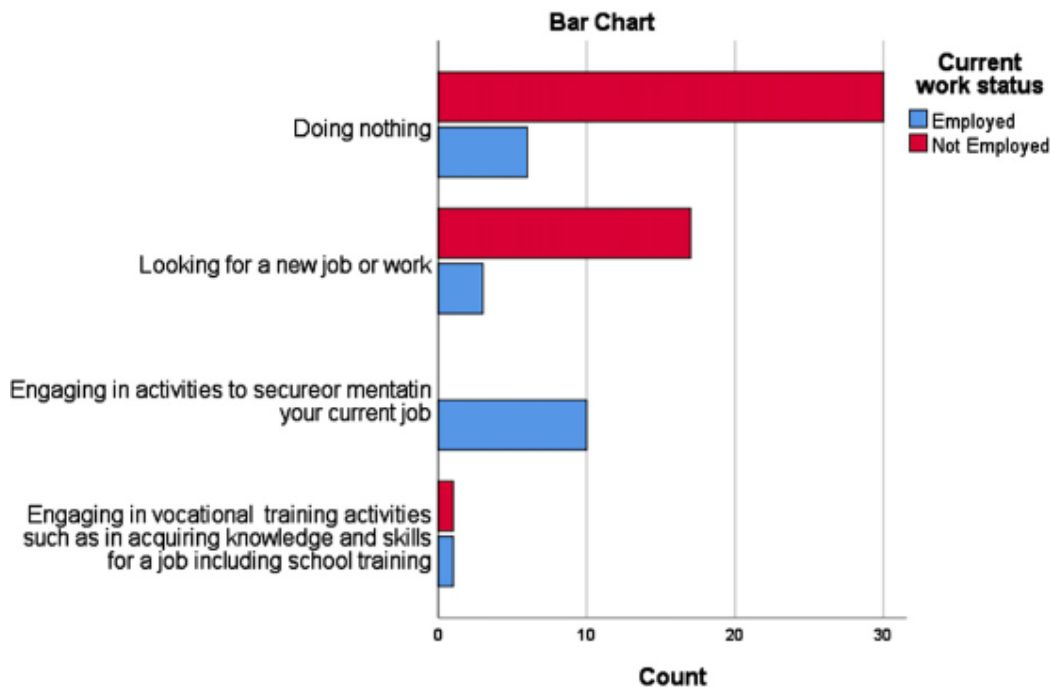


Fig. 1. Vocational intention.

3.4. Vocational intention

In terms of vocational planning and intentions, the majority of the respondents were either doing nothing (52.9%) or looking for a new job (29.4%). Only two (2.9%) individuals were engaged in vocational training activities such as in acquiring knowledge and skills for a job including school training (Fig. 1). There was a significant association ($p = 0.016$) in RTW intentions among those with post-SCI complications.

4. Discussion

The aim of this study was to explore and identify the impact of impairment, socio-demographic and environmental factors on returning SCIS to their worker role. The study established an unemployment rate of 70.6% among SCIS of working age group in Namibia, slightly higher than those of previous studies from developed countries of between 21.0% and 67.0% [1, 9, 14–16]. Seven variables were significantly and strongly associated with work status of survivors of SCIs. These were time since injury, complications post-SCI, current medical or therapeutic treatment, vocational intervention, family support, supervisor/employer support and government support. Surprisingly, age, gender, marital status, education, level of injury and completeness of injury did not have a statistically significant influence on the re-employment of SCIS. This was inconsistent with some reviewed studies which showed significant impact of these factors on return to work [9]. This may imply that the participants are more likely to be able to cope with their demographic factors better than the external factors like vocational intervention.

The employment rate was higher 2–4 years after injury and more than 10 years post-injury. Previous studies showed that re-employment gradually increases from 5 years post-injury onwards [1, 17, 18]. The higher employment rate in the 2–4 years post-injury range might be due to the desire to return to work especially among the young adults, which might not be sustainable since there is need for re-education, relearning activities and occupational routines, training and adaptation before returning to work as posited by Teodorescu et al. [18], Kang et al. [1] and Bergmark, Westgren and Asaba [19]. Although on average it took five years post-injury to return to work, some took as short as three months after SCI [16, 17].

In this study, post injury complications like pneumonia, pressure sores and urinary tract infections, and medical or therapeutic treatment were negatively related to re-employment of SCIS. This was consistent with previous research that showed that poor health and medical problems related to SCIs can be barriers to return to work due to regular visits for medical and/or therapeutic attention which can lead to continued absence from work caused by long-term sick leave [20–23]. Regular visits for medical and/or therapeutic (physiotherapy, occupational therapy, psychotherapy) attention can lead to continued absence from work due to long-term sick leave. However, Cutajar and Roberts [24] stated that there was no significant association between pressure sore occurrence and whether or not the individual with SCI was employed.

All participants had level C5 or below of SCI (incomplete quadriplegia or paraplegia), with 63.2% sustaining complete injury and 83.3% had mobility challenges that led to wheelchair use. Employment rate of 11.8% was reported among those with cervical injuries. However,

there was no significant association between level, completeness of injury and employment. The higher unemployment rate suggests the lack of vocational rehabilitation to prepare the SCIS for re-employment as reported in the following paragraph. In terms of injury severity, Krause et al. [25], reported low employment rate of 19.0% for those with cervical, non-ambulatory SCI, increasing to 39.6% for those with non-cervical, non-ambulatory SCI. This was also supported by Kang et al. [1].

Vocational interventions were associated with a better chance of returning to work among the respondents in this study. The majority (89.6%) of the unemployed SCIS indicated that they did not receive any vocational intervention and 62.5% were doing nothing about the situation. This finding was consistent with previous studies by Cancelliere et al. [26], Teodorescu et al. [18] and Solheim and Leiufrud [27], who concluded that multi-disciplinary interventions, especially those involving a workplace component, are associated with positive RTW outcomes. The significant lack of vocational interventions in this study might be due to lack of education, shortage of rehabilitation professionals in Namibia, especially occupational therapists. World Federation of Occupational Therapists (WFOT) states that better RTW results are achieved when rehabilitation focuses on functionality using occupational therapy [28]. Teodorescu et al. [18] emphasised that rehabilitation process after SCI should focus on education, vocational training, improving self-care ability, supporting community mobility, ensuring environmental changes and accommodation.

This study showed that support from family, supervisors/employer and government had a significant relationship to employment of SCIS. Families offered moral, financial and self-care support, whilst supervisors provided moral and technical support. The government offered financial support in form of disability grants, and information on job opportunities. With regards to workplace environmental factors, previous studies show that workplace social systems like an early positive supervisor response to injured employees play an important role in the sustained reintegration of injured workers [29]. In Namibia there is legislation that was passed in an effort to enhance employment opportunities for individuals with disabilities, including SCIS [30]. However, there are no enforceable provisions in the legislation that compel employers to facilitate re-employment of injured workers. Shabany et al. [31] concluded that family-centred empowerment process in individuals with SCI is critical in their gradual return to work. This is consistent with other studies that showed the facilitative role that social support and integration can provide in the RTW process [15, 32–34].

The results showed no significant differences in RTW by most of the sociodemographic factors. There was no significant association between age at injury and employment, contrary to other previous studies which reported a negative association between age at injury and employment after injury [7]. The middle-age group of 26–45 years old had more (64.3%) people who were employed than the other age groups. Middle age is the period when people learn social and vocational knowledge and skills [1]. However, due to other confounding factors mentioned earlier, there was generally higher unemployment among all age groups.

Whilst this study showed no significant relationship between gender and RTW of SCIS as supported by Kennedy and Hasson [21] and Schedin et al. [35], previous studies have not been conclusive on this factor. Ottomanelli and Lind [15] reported that some studies have found

males to be more likely to return to work following SCI, whereas other studies have found females to be more likely, and some research have found no difference. The results of this study goes against the expectation that a significance association could be expected due to the difference in the type of jobs that men and women can do post-SCI, that is manual versus non-manual, which might favour women more than men according to Schedin et al. [35].

Marital status was not significantly associated with employment status after SCI. This might seem to contradict the afore-mentioned finding that showed family support as a significant contributor to RTW after SCI.

Educational level did not significantly determine employment of SCIS in this study, as in Kang et al. [1]. This was not consistent with several studies which showed education as the most influential factor regarding employment or RTW status of persons with SCI [16, 27, 36]. People with higher education have more employment opportunities and options, especially for professional or administrative (non-manual) jobs.

Motor vehicle accidents were identified as the leading cause of injury (79.4%), with falls, sports and gunshots having caused SCI to two (2.9%) participants each. Other causes were diseases (5.9%) and assault (5.9%). Motor vehicle accidents are the leading causes of death and disabilities in the developed countries [37], and the World Health Organisation [38] states that road traffic crashes are the leading cause of traumatic spinal cord injuries in Africa (developing countries), accounting for 70% of cases. This is similar in Sub-Saharan Africa including Southern Africa where traumatic spinal cord injuries are most commonly caused by road traffic accidents, followed by falls and violence [39, 40]. A report by Sivak and Scoettle [41] states that internationally Namibia has the highest number of road traffic fatalities of 46 per 100 000 population.

5. Strengths and limitations of the study

One strength of this study is that the data were collected from a survey whose participants had a national representation.

As a limitation, the majority of the participants were sampled from MVAf that has an updated database. The few participants from the rehabilitation departments of the three referral hospitals in the Southern and Northern regions as well as from snowballing did not represent the actual population of SCIS because of poor records. There are no established national trauma or SCI registries in most developing countries which is complicated by the fact that medical record keeping is poorly managed in most of the hospitals [42]. This may have introduced selection bias which could limit the generalizability of the study findings although the data was collected from a nationally conducted survey of persons with SCI, which in itself is a strength of the study.

6. Implications for rehabilitation and future research

The findings of this study can be used in establishing vocational rehabilitation programs and employment support systems that are appropriate for SCIS in Namibia. Considering the critical role that occupational therapists play in RTW programs [28], these findings will be used in the development of an Occupational Therapy Return to Work Practice Protocol to be

used by OTs in Namibia in facilitating re-employment of SCIS. Whilst another in-depth qualitative study by the same authors on RTW of SCIS is reported elsewhere to further explore the findings of this study, the questionnaire used in this study can be further modified to also investigate the nature of post-injury employment, retention after RTW, the type, quality and stability of the employment in follow-up studies.

7. Conclusion

The employment rate of 29.4% among SCIS in Namibia which is lower than those in previous studies of 30–70% [7, 16, 43], shows that impairment or injury characteristics such as post-injury complications, and environmental or vocational characteristics like lack of vocational interventions are barriers to the re-employment of SCIS. Socio-demographic factors such as age, gender and educational level were uniquely of no significant impact to post-injury employment of SCIS in Namibia. The significant impact of some vocational and injury characteristics suggests that vocational rehabilitation services are needed urgently to support the people living with spinal cord injuries in returning to their worker role. Returning to work is a significant outcome of SCI rehabilitation.

Ethical approval

The University of Kwazulu Natal BREC approved the study (Ref no. BE634/17).

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Conflict of interest

The authors declare no conflict of interest.

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