

# Determinants of return to work among spinal cord injury patients: A literature review

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**Abstract.** This paper presents a review of the literature of articles that examined determinants of return to work, among persons who experience spinal cord injury. Results of the review highlight the low rate of employment among persons with spinal cord injury. A total of fourteen common factors that influence professional reintegration were identified. These factors include: education, type of employment, severity of the lesion, age, time since injury, gender, marital status and social support, vocational counselling, medical problems, employer's attitudes, race, psychological state, and environment. While a number of variables associated with return to work were identified, there exists great variability across studies. Consequently, no clear conclusion on return to work can be drawn from the literature. This article highlights factors that facilitate professional reintegration, identifies gaps in the literature and suggest paths for future research.

Keywords: Spinal cord injury, return to work

## 1. Introduction

The long term goal of rehabilitation of persons who experience a spinal cord injury (SCI) is community reintegration with the best possible functional independence and a return to one's previous lifestyle. For some, there are multiple challenges to overcome on multiple levels including physical, emotional, financial and professional. The problems that these people must face are complex, especially in the employment sector. Over the years, research in the field of physical rehabilitation aimed to identify factors that contribute to the difficult socio-professional integration of people with disabilities. A recent review on level of participation after SCI found that economic self-sufficiency and oc-

cupation are the most disrupted dimensions among persons who experience SCI, contributing to a concerning number of them lacking financial resources [64]. Lack of financial resources is likely, in part, due to the high unemployment rate following SCI [53].

Many studies have shown that a limited number of people who experience SCI actually work, including those who were employed before trauma. Return to work (RTW) rates following SCI vary depending on the country of study and time since injury. Since the mid eighties, these rates have improved [6,9,18,24,35,47,59,76,78,82,83,86,97]. Even if some positive changes have occurred in recent years, percentage of RTW remains, however, suboptimal.

For approximately 60% of persons who experience SCI, trauma happens between the ages of 16 and 30 years old, corresponding to the prime years for both career development and establishment [35]. The average age of persons with SCI has been reported at 35 years old with two thirds of SCI victims between 25 and 45 years old [65]. Of concern is that many of those who do work after their SCI terminate employment at

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later point in time [24]. Many jobless people with SCI would like to be working, but do not believe it is possible [48] or are faced with employment barriers such as transportation [32]. In fact one study reported that up to 61% of jobless SCI desired to work [32].

Beyond its economic importance, work is perceived as a source of personal growth, self affirmation, a place to develop social contacts that lead to a sense of belonging and a major means of social integration [87] and life satisfaction [89]. Work has been identified as an important domain of quality of life (QOL) [5,10] and has been significantly associated with QOL [20,39,41,48,85], independent living and income [5] and life satisfaction [76,89]. Moreover, positive relationships have been reported between being employed and longevity, health status, personal satisfaction [5,10,42] and positive life adjustment following SCI [40,44]. Work is alleged as a means to attaining autonomy and independence [62] as well as an important activity that enhances self-esteem, a sense of independence and identity [70]. These are the reasons why integration into work is considered a key marker of successful rehabilitation.

In addition to the above mentioned, there is a positive relationship between post-trauma employment and better adaptation following trauma. People who work benefit from a significantly better adjustment in many aspects of their life such as financial satisfaction, social life, control over one's life, pain, independence and health [5,39,40]. Opportunities for employment have been identified as one of the three most important domains of [10] and significant predictors of QOL [81].

As indicated by De Vivo and Richard, most persons who experience SCI are capable of achieving what they define as a satisfactory level of QOL [26]. Through their evaluation of several variables associated with social integration and perception of QOL, these authors found that acceptance of the disability and life satisfaction increases as time goes by. They noted that trauma severity had little effect on life satisfaction; those people who are most limited do not necessarily report lower levels of satisfaction. According to several studies, acceptance of the disability and satisfaction with life increases with time [26,49,55,73,95].

Due to the important role of work on the social integration of persons who experience SCI and its value beyond that of an economic one, a review of the literature is required to better understand issues that influence level of employment following SCI. Hence, this paper explores the literature as it pertains to the professional reintegration of persons who experience SCI. It commences by providing an overview of factors associated

with employability identified in the literature. It then flows toward a discussion of certain key determinants of professional reintegration among persons who experience SCI. The paper closes by identifying gaps in the literature and providing recommendations for further research.

## 2. Literature search and article selection methods

An electronic search of articles from CINAHL, EconoLit, ERIC, SWAD, Embase PsycINFO, Pubmed, Web of Science databases was conducted for articles published from January 1975 to December 2006. Key words included in the search were: return to work, work, employment, barriers, spinal cord injury, spine injuries, and disability. The electronic search results was as follow: 274 articles from CINAHL, Econolit, ERIC, SWAB and Francis, 68 articles from Embase, 62 articles from PsycINFO, 122 article from Pubmed and 204 articles from Web of Science. Of these 730 articles, 455 were kept after discarding doubles. The article title and abstract was reviewed to ensure that the study was specific to determinants of return to work among persons who experience SCI. References from each article were scanned for missed articles. These articles were then examined and retained for review if they suited the review topic. A total of 101 articles were kept for this review. Articles from 11 different countries including the United States ( $n = 62$ ), Australia ( $n = 12$ ), Canada ( $n = 9$ ), Sweden ( $n = 4$ ), United Kingdom ( $n = 4$ ), France ( $n = 3$ ), Netherlands ( $n = 2$ ), Taiwan ( $n = 2$ ) and one article from China, Turkey and Italy were reviewed.

## 3. Review results

A review of the literature yielded eleven key factors associated with employability among persons who experience SCI: education, type of employment, disability severity, age, time since injury, gender, marital status and social support, vocational counselling, medical problems related to SCI, employers role, environment, and professional interests. Other factors less frequently studied included; ethnicity, and personal factors such as self-confidence and esteem.

#### 4. Education and type of employment

Education has been identified as an important predictor of employability among persons who experience SCI [5,15,18,27,30,35,37,42,44,50,52,57,59,68,82,85,86]. A study by Krause (1992) shows that persons with less than 12 years of education are at a disadvantage when it comes to integrating into the workforce [42]. Those with less years of education have more difficulty both obtaining and keeping work. According to their study, participants with 16 or more years of schooling (69% to 72%) have better rates of employability. Furthermore, almost all those in this group work at some point in time (93% to 96%). A recent study from Taiwan reported a 2.2 fold higher chance of RTW after SCI among persons with a high school education compared to those without this level of education [37]. Another study reported that college educated persons who experience SCI were 73% employed, 14% productive, and 14% unemployed compared to 56% unemployed and 40% in productive activity among those with less than a high school education [101].

There are a number of reasons that help explain this phenomenon of higher employability among those with higher levels of education. For instance, increased educational attainment has been directly linked to higher social economic status and increased employment option [35]. The more educated someone is, the less likely they are to occupy manual type jobs, which favours their potential to RTW in a variety of areas [35]. Closely related to education is type of employment. Persons who experience SCI are more likely to be employed in professional, administrative or managerial types of jobs after injury. These sorts of jobs normally require a higher level of education. One study found that 25% of employed persons who experience SCI moved from unskilled into a skilled or professional position and 13% moved to an office position [32]. Adjustment to SCI among those with a higher level of education requires less change in their occupation, when compared to those with a lower level of education. Furthermore, persons with a higher level of education are more likely to be involved with the community, to hold a management type position [21] are more autonomous [2] and motivated [57] to obtain gainful employment than those with a lower level of education.

As well, a recent study found that higher level of education was significantly related to positive personal predictions for RTW which in turn was positively associated with RTW [72]. Personal expectations to RTW increased their chances of successful reintegration. In a

sample of 57 persons who experience SCI, of which 49 were employed at the time of trauma, 45% expected to RTW and in 67% of these cases RTW was successful.

Data suggest that sometimes persons who experience SCI return to school [71]. The National Spinal Cord Injury Statistical Center, in the United States, reported that 46.5% of persons who experience SCI obtained a high school diploma within 5 years of injury [1]. Others reported that about half of persons with schooling equivalent to grades 9 to 11 ended their high school education following their trauma, while 12% of those who had a high school diploma continued their education to obtain a higher degree within 5 years following their trauma [26].

Most persons who experience SCI do not have advanced degrees; consequently it is more difficult for them to find employment. Increased training strongly increases employability following trauma underscoring the importance of education in the professional rehabilitation of persons who experience SCI.

As mentioned above, persons who experience SCI are likely to return to non-manual jobs such as a professional specialty, administrative or managerial jobs after their injury. An exception seems to be farm workers. A recent study by Young et al reported that RTW (at least 10 hours a week) among agriculture workers following SCI is relatively high (61%) when compared to other industry workers (41%) [99]. These results are in line with earlier studies by these same authors [98].

#### 5. The severity of the lesion

The reported relationship between RTW and severity is inconsistent. While many studies have shown that RTW does not depend on severity of the lesion [11,18,40,78,91], others have stated the contrary [27,50,52,68,91,101]. A recent study reported severity of lesion as an obstacle to work participation in 70% of men and 50% of women study participants [85].

Some studies have found higher rates of employability among persons who experience paraplegia when compared to quadriplegia [65,68,78,91]. For example, one study reported less severe injury as a key predictor of re-employment [50]. Even though most studies have reported lower rates of employability among persons who experience quadriplegia, one study reported no relationship between type of impairment and participation in the work force including time between SCI and first RTW [31]. Another study reported 13.9% and 21.4% RTW at least 6 months following discharge

from rehabilitation for those who experience paraplegia versus quadriplegia respectively [54].

Krause's (1992a) work suggests that it can take longer for a person who experiences quadriplegia to RTW, and that they are more likely to return to their original job and to work for more years [42]. These findings shed light on training as an important objective for persons who experience SCI, especially quadriplegia, as it would help decrease disadvantages related to disability. Another study reported level of functional independence as a significant positive predictor of vocational status. Persons who were employed were more functionally independent [101].

The level of severity of the lesion can influence the type of work selected by persons who experience SCI. For example, at the time of the accident few people work in professional areas such as clerical work or sales. Four years following trauma, 63% of persons who experience paraplegia and 78% of those who experience quadriplegia occupied these types of jobs [100]. Persons who experience quadriplegia are more likely to hold technical, management, and sales positions, while persons who experience paraplegia occupy these types of employment as well as mill/factory work [74]. Sustaining a complete cervical lesion was associated with lower scale employment post-injury [15]. Gender specific studies indicate that women who experience paraplegia are more likely to RTW than women who experience quadriplegia, they are more likely to be young with a higher level of education [24,25].

## 6. Age

Chronological age and age at the time of trauma are two important elements linked to RTW among persons who experience SCI. Many studies show that age at the time of injury was significantly related to RTW [23–25, 35,44,50,51,51,52,68,78,85]. A review of the literature reported that older age at injury onset is negatively correlated with post-injury employment [96]. The same correlation has been observed for chronological age [79]. For example a recent Swedish study reported an increased risk of non RTW for men over 55 [85]. Age was not a significant predictor among women however. Being young at the time of injury is a good indicator of obtaining [68,85] and conserving work [42]. Those who are injured before 30 years of age have a greater chance to obtain employment than those over 30 years old [29]. Similar results were reported by a

recent study, except 40 years of age was the critical age for non RTW as opposed to 30 years old [85].

It appears that the importance of professional activities decreases between 51 and 60 years of age [42]. People who are 50 years old or older at the time of injury are not likely to return to the labour force, unless they return to their previous job [48]. The poor RTW rate among those who are older may be due to two factors: the decreased ability to adapt and the difficulty employers may encounter when hiring or rehiring persons with limited time left in their professional life. The process of coping following a SCI is likely easier for a younger person facilitating their ability to return to pre-injury activities or develop interest toward new activities [63].

While age has shown up as an important predictor of RTW, there are important differences in terms of work experiences that must be considered when examining age as an influential factor for RTW. With adult-onset SCI many persons have already obtained work experience or are employed at the time of injury. In contrast, those with paediatric-onset SCI have had no adult experience before injury and are significantly less likely than non SCI adolescents to obtain paid work experience [5]. Growing up with SCI can impact on expectations about employment and the possibility of work experiences. In fact, Anderson and Vogel reported that in adults with paediatric-onset SCI, age at injury is not related to employment. There is, however, evidence highlighting higher rates of employment among paediatric-onset (sustained SCI at age 18 or younger) versus adult-onset SCI [5]. In their study of employment and participation following paediatric-onset SCI, they reported employment rates of 51% at least 6 years following SCI onset.

## 7. Time since injury

Most persons who experience SCI do not RTW immediately following hospitalization. According to recent American national level statistics, the percentage of persons who experience SCI who were employed following trauma was 13% 1 year after the trauma, 22% 5 years, 28% 10 years, 35% 15 years, 37% 20 years and 41% 25 years following the incident [1]. These results and others imply that, following trauma, the rate of employability increases considerably with time [1, 17,68,85]. For example, one study reported that the odds men RTW was greater among those who had sustained their injury since at least 10 years [85]. In con-

trast however, Young and Alfred reported results from their cross-sectional study which indicated that time since injury was not a significant factor in predicting employment status [101]. These authors caution that measuring employment cumulatively over time artificially enhances the likelihood of increasing successful vocational outcomes. According to Krause (2003) an average of 4.8 years goes by from SCI onset to return to first post-injury job and 6.3 years to first full-time employment [43]. Krause suggests that there are two tracks for RTW. A fast track in which the person who experiences SCI returns to pre-injury employment and a slow track which requires the individual to obtain training and education which takes on average 4.6 years to obtain [43]. An early study by Alfred et al, reported that RTW planning is scarce during the first 2 years following trauma. While the authors of that study suggest it would be beneficial to provide professional rehabilitation services only after these first 2 years [2], others have highlighted that persons provided with these services early on in the rehabilitation process are more likely to be employed 3 years following the trauma than those who receive these services at a later point in time [38]. One study found that most of their study participants thought of RTW 1 to 2 years post SCI onset [13]. A minority of persons who experience SCI return to their original employment [42]. One study noted that people who return to the same job as before trauma tend to RTW earlier than those who enter new jobs. Indeed other studies have also reported that those who RTW a short time following their injury almost always return to their original job [14]. On the other hand, people who experience SCI who are absent from the workforce for many years usually return to different employment [100]. This is not surprising considering a career change sometimes requires retraining and more time to adjust to a new position [12,15]. Another positive predictor of employment following more generally traumatic spine fracture is pre-injury employment status [11].

At the same time, RTW does not guarantee employment sustainability. Many of those who RTW decide to discontinue work at some later point in time [27, 29]. It is therefore important to continue to provide professional rehabilitation services or other educational services necessary to both return and stay in work [26].

## 8. Gender

A number of researchers have found correlations between gender and employability. Very few report

no differences between genders for RTW following SCI [51,56]. It is important to note that, for the most part, study populations are comprised primarily of men [18]. According to some studies, men are more likely to be employed following a SCI than women [36,52,82,85,86]. Young and Alfred examined the vocational status among a cross-section of persons who experience SCI living in the community [101]. They found that men were two times as likely as women to be in paid employment (30% vs. 15%). Some authors have reported that women who have a higher level of education, were more likely to RTW than men after SCI [46]. It has been suggested that these differences can be explained by the financial resources available and the type of work obtained by men and women [48]. Other factors that may contribute to more women than men RTW is the nature of activity they are traditionally involved in. For example, women are more likely than men to occupy non-manual occupations such as office work or teaching [69,92] as opposed to more manual type jobs such as construction work. From a rehabilitation perspective it is important to note that the predictors for RTW seem to differ across genders [85]. For example, age, age at injury and neuropathic pain were not predictors of RTW among women, these factors were, however, significant among men. The authors of the aforementioned highlight that coping strategies adopted by each gender tend to differ. Hence programs that aim at RTW should be gender specific.

## 9. Marital status and social support

The relationship between marital status and employability is both complex and conflicting. A strong social network has been associated with an easier RTW after SCI [56] and social support has been identified as a significant facilitator to participation [64] and higher occupational activity [32,75]. Hence, one might suspect that someone who is married would have a better chance to RTW due to the support in the couple. Indeed, there have been reports of an increased probability of RTW among married individuals when compared to singles [29,35,37,68]. In contrast, some researchers have reported no significant difference between married and single individuals who experience SCI and RTW [27,86].

## 10. Vocational counselling

In general, a major change in functional ability does not change one's professional interests [18]. However, depending on the severity of SCI and type of employment occupied before injury, one may have little option but to consider a different profession. Such changes may bring on a number of identity problems related to professional decision making. Changes in professional identity can be challenged by lack of information on employment and the presence of environmental and personal barriers in career choices [19]. Two recent studies reported that vocational rehabilitation improved RTW among men [85] and men and women [37] who experience SCI. Another study reported high employment rates (50 to 60%) among persons who completed a rehabilitation training program that included vocational training and counselling [91].

A study by Wehman [93], found that 37% of study participants felt that they did not receive enough information on professional rehabilitation, half indicated that the information provided during the rehabilitation process did not adequately support them for preparing for work [93]. Of those who were unemployed most would prefer to work if suitable employment was available [93]. Another study reported lack of a suitable job as the most important barrier to work [31].

## 11. Medical problems related to the disability

Studies show that poor physical health and frequent hospitalization explains, in part, professional inactivity among some people [5,9,11,16,29,31,64]. A recent review which touched on QOL and SCI reported a positive association between the occurrence of secondary impairments and restriction on occupation [64]. One study reported a significant positive association between certain medical conditions, including hospitalization, and unemployment [5]. Other studies have reported medical problems as one of the most frequently mentioned personal reason for not having a job [31, 85].

## 12. Employers role

Employers can play a key facilitating role in the RTW of persons who experience a disability such as SCI. This facilitating role, however, depends largely on the employer's capacity to accommodate persons who ex-

perience a disability [84]. Unger and Kregel conducted a study on employer's knowledge and utilisation of accommodations among 46 human resource professionals and 255 supervisors representing 43 businesses. Their results highlight employer's confidence (60%) in their ability to accommodate persons with a disability. This confidence, however, does not always translate into action. Specifically, there appears to be a lack of employer knowledge of the external resources and supports available to aid employers make accommodations. As well, some employers, while willing to accommodate, do not have the authority to make the necessary accommodations. Moreover, their results indicate that supervisors are less confident in their ability to address the functional limitations of employees with a disability. Specifically, supervisors are less sure when it comes to making accommodations that involve making structural changes to the work environment, providing assistance unrelated to the job function, and swaying from typical organizational standards. While employers are willing to accommodate, interventions should, however, aim at increasing employer knowledge of external supports and resources that would allow them to recruit and retain employees with a disability.

Two recent studies specific to persons who experience SCI, reported that of those who RTW, the majority were able to do so, in part, because of modifications including job adaptations and decreased work hours [14, 72]. A qualitative study reported that returning to a pre-injury employer was a key factor determining RTW success [14]. Participants in their study indicated that returning to work was easier due to the fact that they were able to RTW for the same employer. Participants felt that an employer who knows them would be more likely to make accommodations to facilitate their RTW. In line with this, results from a qualitative study indicated that all of the study participants who RTW, returned to the same employer or to one whom they were put in contact with through a friend [13]. At the same time, lack of knowledge and understanding of disability and negative attitudes on the part of the employer can act as obstacles to RTW for persons who experience a disability such as SCI. Some research results indicate that employers may have an unrealistic vision of performance and ability of persons who experience SCI [83]. As well, employers may be discouraged by the presence of apparent obstacles such as architectural barriers, transportation difficulties and medical complications. A recent UK study, while not specific to SCI, examined the opinion of disability-organizations about factors that make it difficult for people to find work after

losing a job, to stay in work and RTW in the presence of a disability or disease. They reported that employers' attitude toward disabled people was the most important factor making it difficult to stay in work (prejudice, negative views, bullying, ignorance, inequality). Lack of understanding, knowledge and awareness of the disability on behalf of the employer was a clear barrier to RTW. Another study reported that perceived discrimination in the workplace was associated with lower quality jobs post injury [15]. These results reinforce the idea that employers must pay greater attention to the specific needs of persons who experience a disability [77]. Krause [43] highlights that outreach personnel must work with the employer to provide accommodations needed after SCI [43]. Overall, these studies point out that employers have a key role to play in the success of RTW among persons who experience a disability.

### 13. Race

Some studies have reported race as a predictor of employment following SCI. However the authors caution interpretation of findings based on race, as race is a key factor among the general population as well [58]. Being Caucasian has been linked to increased employment following SCI trauma [24,68]. Krause et al. [50] reported being Caucasian as a key predictor of re-employment [50]. In an earlier study it was found that Caucasians were 2.8 times more likely to RTW than minority participants [51]. These authors point out that factors leading to poorer outcomes among minority individuals have never been clarified. It seems, however, that minority individuals may face more barriers in their attempt to RTW. Examples of such barriers include employer prejudice [48].

### 14. Psychological state

There is little information in the literature linking psychological state to RTW. Personal factors such as low confidence and self-esteem, anxiety or fear on the part of the person who experiences a disability, not specifically SCI, contributes to difficulty staying in work [13,77]. Optimism, being achievement oriented, rehabilitation locus of control, work attitude and having a role model have all been associated with RTW among persons who experience SCI when compared to individuals who did not RTW [13,14,61]. A study

realised in 1982 reported that the best predictors of RTW 8 years following injury onset were vocational plans, work interests, the value placed on work, level of motivation to RTW and ones outlook on rehabilitation [34]. More recently, a study found that psychological variables such as rehabilitation locus of control and work attitude significantly contributed towards predicting RTW [61]. These authors suggest that psychological factors may be among the most important predictors of RTW. These results and others highlight the need to plan for RTW and work on developing a positive attitude toward work. A recent study reported that percentage of time spent in work following injury was predicted by work attitude [60] and another reported that lack of motivation was a hindrance to work participation for 30% of study participants [85].

### 15. Environment

Both physical and social environmental barriers to RTW have been cited in the literature. In regard to physical barriers, transportation, housing, accessibility and accommodations have all been noted [9,14,15,37,80,85]. Similar findings have been reported from a general disability study. This study reported that transport problems and inability to access buildings prevented employees with a disability from staying in work [77]. Another study reported that persons with SCI who could use public or private transportation independently were 2.7 times more likely to RTW [37].

Persons who experience SCI have expenses directly related to their disability, such as medical expenses, expenses related to care, equipment and transportation [74]. For some of these people, the latter is a hindrance to obtaining and keeping employment. A number of studies mentioned that many persons who experience SCI are not inclined to RTW in fear of losing their financial benefits [14,21,28,74,94]. In France this stands true particularly for persons with low levels of education who may find it difficult to find jobs with similar pay to what they had pre-injury, and hence prefer government financial assistance [13]. Financial compensation programs, policy and services can have a direct impact on RTW. Indeed, a recent US study reported that the most significant barrier to QOL in young adults (24 yrs old) who experience SCI, was policy (both government and business policies or rules). Policy was followed by physical and structural barriers. Such barriers are associated with decreased participation and low life satisfaction [4].

Social environmental barriers, particularly monetary incentives and disincentives, have been noted as key environmental factors associated with employment following SCI [14]. A recent study from the US reported that lower level of social security disability insurance benefits and calendar years since the implementation of the Americans with Disabilities Act were associated with a greater likelihood to RTW [68]. This study is one of the few that accounted for the impact of policy change on RTW. Of interest is a Swedish study which reported high rates (80%) of employment or engagement in studies following a SCI [76]. In Sweden, employers are required to offer alternative employment to employees who have become debilitated as a result of an injury. The policies in place are such that the person benefits from training and services which favour RTW within a short period of time. Community support and services that these persons benefit from facilitate their RTW [76]. For example, in the United States the Ticket to Work and the Work Incentives Improvement Act are deemed an essential tools for persons who experience SCI to RTW quickly after injury [7].

In Québec, Canada, for example, individuals who are victims of trauma, caused by a car accident or who are injured on the job are financially compensated by public insurance programs. These programs target RTW and therefore compensation is usually provided on a temporary basis and depends on the ability of the individual to RTW. Compensation, however, does not guarantee professional reintegration [65]. In Holland, for example, invalidity compensation is equivalent to 70% of the person's salary before trauma [82]. There has been some question as to whether or not the existence of such compensation programs could be an underlying reason explaining the high level of professional inactivity [82]. In line with this, other authors have found that financial compensation decreases the probability that one will become employed [8,31,66,90]. Some have suggested that modifications be made to the compensation programs to render them more financially attractive to RTW [3].

## 16. Discussion

This review of the literature underscores the low rate of employment among persons who experience SCI. A number of factors that influence professional reintegration have been identified in this review and include: education, type of employment, severity of the disability, age, time since injury, gender, marital sta-

tus and social support, vocational counselling, medical problems, employer's role, race, psychological state, and environment. This review also highlights the difficulty in providing a clear and complete portrait of factors associated with the professional integration of those who experience SCI. While our review has identified a number of variables associated with RTW there exists great variability across studies. Consequently, the current state of the literature on RTW is inconclusive. Results reported are often ambiguous and the relationships between factors are weak underscoring the complexity and the multidimensional nature of the RTW process [86]. Furthermore, it is difficult to make comparisons across studies due to the differences in research protocols, such as the definition of employability, including or not students, and or domestic workers, sampling procedures, participant characteristics, methodology and study variables [6,83]. In addition, it is important to consider that while there are generalizations to make across studies in terms of percentage of persons employed, these percentages can not be compared against each other unless certain characteristics between respondents are equivalent such as age, the time since the trauma, the severity of the disability, education, and occupation [18]. Beyond these equivalences, when one compares rate, contextual factors should be considered as well.

Physical and environmental factors along with policies in place which encourage or discourage one to seek employment should be taken into consideration when examining determinants of RTW. For example, the variation in employment rates reported across countries may be in part due to difference in social support and insurance systems [85]. These factors should be analysed at the micro, meso and macro levels [33].

Education and training stands out as an important factor to RTW. Pursuing an education [45], professional rehabilitation training and support [26], employment support and training [93]: facilitate a greater percentage of persons who experience SCI to RTW. From a clinical perspective, this indicates that education and training should be a priority for this population in order to facilitate their integration into a work environment that requires special skills [66]. Many persons who experience SCI have been absent from the workforce for months or years. Over this time, their skills could become outdated and self-esteem and confidence are often diminished. Obtaining training and support to seek employment are essential especially for those with a severe disability [93].

Moreover, it is important not to limit rehabilitation efforts to the short time period following trauma [42].

For some, the desire to seek professional activities raises to the surface many years after the initial trauma. In many cases, the person would be ready to RTW once their situation has stabilized and the level of functioning is to their satisfaction [82]. Others leave their job after having been employed for a certain period of time. These examples highlight the necessity to offer professional training for a long time following the initial trauma. It also underscores the need to take the time to focus on the individual's process of occupation appropriation [88]. Often, professional rehabilitation services end once the person has returned to the workforce, this however does not respond to the needs of those whose physical condition may deteriorate over time [42]. From a policy perspective, on the other hand, government policies should be adjusted to continue to finance different professional training and rehabilitation programs [41].

If work place satisfaction depends on the level of interest accorded to it and the underlying conditions related to it [86], it is important to recognize that reaching paid employment is not the main goal for all persons who experience SCI. For those whom work consisted of volunteer or domestic activities, the appropriate goal would be to return to these activities [26]. Non-professional activities are also legitimate to rehabilitation, and often provide the same advantages to the lives of those who experience SCI [40]. For example, Krause [40] found that unpaid or voluntary productive activities are related to better adjustment [40]. De Vivo and Richard suggest that the evaluation of successful community reintegration should employ a definition of work that includes all productive activities paid or not [22].

## 17. Conclusion and future research

Persons who experience a disability remain under-represented in workforce. This is true even though resources have been invested in work reintegration and there exists a number of public and community based organizations that provide services to help reintegration. Different facilitating factors and conditions for the integration of persons who experience a disability have been identified and include: employment assistance programs, flexible social protection programs, specialized workforce services, permanent support, and a comprehensive network of services in which training is a clear mandate of the social policies in place [67]. Moreover, persons who experience SCI should be able

to benefit from technical assistance in order to help them overcome environmental barriers and benefit from flexible transportation services [93]. While research efforts have been made to uncover determinants and barriers to work, there is a lack of research investigating clinical interventions that could make the reintegration into the work force an easier option.

In summary, results of this review suggest that RTW is a dynamic process, in which the importance of different variables varies depending on the post-trauma period. Ability to work changes as a person adjusts to their disability. Examining the influence of each variable across time is then of great interest. In light of this and the fact that RTW increases with time, it is recommended that studies be longitudinal in nature. As well, longitudinal studies would allow one to examine the life transitions of persons who experience SCI.

There are a number of other areas that would benefit from future research. Specifically, the influence of social and psychological variables in the RTW equation is gaining importance, however the need to further explore this factor has been highlighted by several researchers [61]. As well, according to Noreau and Shepard [66], psychosocial aspects of rehabilitation should be taken into consideration when planning interventions. If social support and psychological aspects have been identified as important in the rehabilitation process, the effects of these have not been clearly established and future research is required to do so. For example, the relationship between work satisfaction and quality of life among person who experience SCI is not clear and merits further research [93]. Another interesting area to explore would be personality type and psychological variables with employability. Research efforts should also be invested in obtaining information on employer's attitudes toward persons who experience SCI, family attitude and, the influence of one's social network and health professional in decisions to RTW.

Engaging in unpaid productive activity has also been related to overall adjustment [40] and is considered a viable and appropriate option for many [88]. In light of this, it is recommended that future research adopt a broad definition of RTW that embraces the notion of productive activity and includes participation in activities related to education, community involvement (volunteering and formal organization), domestic and leisure activities.

In the future researchers should take the time to systematically review the local policies in force that could potentially influence decisions to RTW. A recent study emphasised the need to conduct research that address

policy relevant features such as job accommodations and other environmental factors [52].

From a clinical perspective, there is a need for intervention studies to identify, for example, when is the best time to provide persons who experience SCI information, support and resources for RTW, since the processing of such information may be influenced by the timing of presentation of information [32].

Over the last 50 years the specialisation of rehabilitation progressively lost the bond that existed between the rehabilitation world and the work world. These bonds and ties were characterised, in the past, by a close relationship between the physician and employer. Consequently, this loss leaves rehabilitation up against a great challenge to reinforce links between the work place and rehabilitation centers. Moreover, this collaboration needs to take place not only during or just after intra-mural rehabilitation activities but also 4 and 5 years after the trauma.

The goal of this literature review was to identify factors associated with RTW. The text highlights factors that facilitate professional reintegration and suggest paths for future research.

## References

- [1] *Annual report for model SCI care systems* (2004).
- [2] W.G. Alfred, M.J. Furher and C.D. Rossi, Vocational development following severe spinal cord injury: a longitudinal study, *Archives of Physical Medicine and Rehabilitation* **68** (1987), 854–857.
- [3] L. Alsop, Address to the National Taxation Summit, *Australian Disability Review* **2** (1985), 20–23.
- [4] C. Anderson, L.C. Vogle, K.M. Willis, R.R. Betz and C.M. McDonald, Environmental factors and their impact on outcomes of adults with pediatric-onset spinal cord injuries, *Developmental Medicine & Child Neurology* **47**(102) (2005), 23. Ref Type: Abstract.
- [5] C.J. Anderson and L.C. Vogel, Employment outcomes of adults who sustained spinal cord injuries as children or adolescents, *Archives of Physical Medicine and Rehabilitation* **83** (2002), 791–801.
- [6] J.A. Athanasou, D.J. Brown and G.C. Murphy, Vocational achievements following spinal cord injury in Australia, *Disability and Rehabilitation* **18** (1996), 191–196.
- [7] S. Atwell and L. Hudson, Social security legislation creates Ticket to Work and Work Incentive Improvement Act, *Topics in Spinal Cord Injury Rehabilitation* **9** (2004), 26–32.
- [8] M. Berkowitz, *Disincentives and the Rehabilitation of Disabled Persons*. (vols. 2) New York: Springer Publishing, 1981.
- [9] K.A. Boschen, M. Tonack and J. Gargaro, Long-term adjustment and community reintegration following spinal cord injury, *International Journal of Rehabilitation Research* **26** (2003), 157–164.
- [10] B.B. Boswell, M. Dawson and E. Heinger, Quality of life as defined by adults with spinal cord injuries, *Journal of Rehabilitation* (1998), 27–32.
- [11] R.S. Burnham, S.A. Warren, L.A. Saboe, L.A. Davis, G.G. Russell and D.C. Reid, Factors predicting employment 1 year after traumatic spine fracture, *Spine* **21** (1996), 1066–1071.
- [12] R. Castle, An investigation into the employment and occupation of patients with a spinal cord injury, *Paraplegia* **32** (1994), 182–187.
- [13] S.K. Chan and D.W. Man, Barriers to returning to work for people with spinal cord injuries: a focus group study, *Work* **25** (2005), 325–332.
- [14] M. Chapin and D. Kewman, Factors affecting employment following spinal cord injury: A qualitative study, *Rehabilitation Psychology* **46** (2001), 400–416.
- [15] L. Conroy and K. McKenna, Vocational outcome following spinal cord injury, *Spinal Cord* **37** (1999), 624–633.
- [16] D.W. Cook, B. Bolton and P. Taparek, Rehabilitation of the spinal cord injured: life status at follow-up, *Rehabilitation Counselling Bulletin* **25** (1981), 110–122.
- [17] N. Crewe and J.S. Krause, An eleven-year follow-up of adjustment to spinal cord injury, *Rehabilitation Psychology* **35** (1990), 205–210.
- [18] R. Crisp, Return to work after spinal cord injury, *Journal of Rehabilitation, January* (1990), 28–35.
- [19] R. Crisp, Vocational decision making by sixty spinal cord injury patients, *Paraplegia* **30** (1992), 420–424.
- [20] L. Cushman and J. Hassett, Spinal cord injury: Ten and fifteen years after, *Paraplegia* **30** (1992), 690–696.
- [21] G. De Jong, L.G. Branch and P.J. Corcoran, Independent living outcomes in spinal cord injury: multiple analyses, *Archives of Physical Medicine and Rehabilitation* **65** (1984), 66–73.
- [22] M.J. De Vivo and J.S. Richards, Community reintegration and quality of life following spinal cord injury, *Paraplegia* **30** (1992a), 108–112.
- [23] M.J. De Vivo, J.S. Richards and S.L. Stover, Spinal cord injury: rehabilitation adds life to years, *Western Journal of Medicine* **154** (1992), 602–606.
- [24] M.J. De Vivo, R.D. Ruth, S.L. Stover and P.R. Fine, Employment after spinal cord injury, *Archives of Physical Medicine and Rehabilitation* **68** (1987), 494–498.
- [25] M.J. De Vivo and P. Fine, Employment status of spinal cord injured patients 3 years after injury, *Archives of Physical Medicine Rehabilitation* **63** (1982), 200–203.
- [26] M.J. De Vivo and J.S. Richards, Community reintegration and quality of life following spinal cord injury, *Paraplegia* **30** (1992b), 108–112.
- [27] M.J. De Vivo, R.D. Ruth, S.L. Stover and P.R. Fine, Employment after spinal cord injury, *Archives of Physical Medicine and Rehabilitation* **68** (1987), 494–498.
- [28] M.A. Dew, K. Lynch, J. Ernst and R. Rosenthal, Reaction and adjustment to spinal cord injury: a descriptive study, *Journal of Applied Rehabilitation Counselling* **14** (1983), 32–39.
- [29] A.Z. El Ghatit and R.W. Hanson, Variables associated with obtaining and sustaining employment among spinal cord injured males: a follow-up of 760 veterans, *Journal of Chronic Disability* **31** (1978), 363–369.
- [30] A.Z. El Ghatit and R.W. Hanson, Educational and training levels and employment of the spinal cord injured patient, *Archives of Physical Medicine and Rehabilitation* **60** (1979), 405–406.

- [31] S. Engel, G.S. Murphy, J.A. Athanasou and L. Hickey, Employment outcomes following spinal cord injury, *International Journal of Rehabilitation Research* **21** (1998), 223–229.
- [32] I. Fiedler, D. Indermuehle, W. Drobac and P. Laud, Perceived barriers to employment in individuals with spinal cord injury, *Topics in Spinal Cord Injury Rehabilitation* **7** (2002), 73–82.
- [33] P. Fougeyrollas, L. Noreau and K.A. Boschen, Interaction of environment with individuals characteristics and social participation: Theoretical perspectives and applications in persons with spinal cord injury, *Topics in Spinal Cord Injury Rehabilitation* **7** (2002), 1–16.
- [34] R.T. Goldberg and M.M. Freed, Vocational development of spinal cord injury patients: an 8-year follow-up, *Archives of Physical Medicine and Rehabilitation* **63** (1982), 207–210.
- [35] D.W. Hess, D.L. Ripley, W.O. McKinley and M. Tewksbury, Predictors for return to work after spinal cord injury: a 3-year multicenter analysis, *Archives of Physical Medicine and Rehabilitation* **81** (2000), 359–363.
- [36] M. James, M.J. De Vivo and J.S. Richards, Post-injury employment outcomes among African-American and white persons with spinal cord injury, *Rehabilitation Psychology* **38** (1992), 151–164.
- [37] Y. Jang, Y. Wang and J. Wang, Return to work after spinal cord injury in Taiwan: The contribution of functional independence, *Archives of Physical Medicine and Rehabilitation* **86** (2005), 681–686.
- [38] H.M. Jellinek and R.F. Harvey, Vocational/educational services in medical rehabilitation facility: outcomes in spinal cord and brain injured patients, *Archives of Physical Medicine and Rehabilitation* **63** (1982), 87–88.
- [39] B.J. Kemp and C.T. Vash, Productivity after injury in a sample of spinal cord injured persons; a pilot study, *Journal of Chronic Diseases* **24** (1971), 259–275.
- [40] J.S. Krause, The relationship between productivity and adjustment following spinal cord injury, *Rehabilitation Counselling Bulletin* **33** (1990), 188–199.
- [41] J.S. Krause, Adjustment to life after spinal cord injury: a comparison among three participant group based on employment status, *Rehabilitation Counselling Bulletin* **35** (1992a), 218–289.
- [42] J.S. Krause, Employment after spinal cord injury, *Archives of Physical Medicine Rehabilitation* **73** (1992b), 163–169.
- [43] J.S. Krause, Years to employment after spinal cord injury, *Archives of Physical Medicine Rehabilitation* **84** (2003), 1282–1289.
- [44] J.S. Krause, Employment after spinal cord injury: transition and life adjustment, *Rehabilitation Counselling Bulletin* **39** (1996), 244–256.
- [45] J.S. Krause, Adjustment after spinal cord injury: a 9-year longitudinal study, *Archives of Physical Medicine and Rehabilitation* **78** (1997), 651–657.
- [46] J.S. Krause and C.A. Anson, Employment after spinal cord injury: relation to selected participant characteristics, *Archives of Physical Medicine and Rehabilitation* **77** (1996a), 737–743.
- [47] J.S. Krause and C.A. Anson, Adjustment after spinal cord injury: relationship to participation in employment or educational activities, *Rehabilitation Counselling Bulletin* **40** (1997), 202–214.
- [48] J.S. Krause and C.A. Anson, Self-perceived reasons for unemployment cited by persons with spinal cord injury: relationship to gender, race, age, and level of injury, *Rehabilitation Counselling Bulletin* **39** (1996b), 217–228.
- [49] J.S. Krause and N.M. Crew, Chronological age, time since injury, and time of measurement: effect on adjustment after spinal cord injury, *Archives of Physical Medicine and Rehabilitation* **72** (1991), 91–100.
- [50] J.S. Krause, D. Kewman, M.J. DeVivo, F. Maynard, J. Coker, M.J. Roach et al., Employment after spinal cord injury: an analysis of cases from the Model Spinal Cord Injury Systems, *Archives of Physical Medicine and Rehabilitation* **80** (1999), 1492–1500.
- [51] J.S. Krause, M. Sternberg, J. Maides and S. Lottes, Employment after spinal cord injury: differences related to geographic region, gender, and race, *Archives of Physical Medicine and Rehabilitation* **79** (1998), 615–624.
- [52] J.S. Krause and J.V. Terza, Injury and demographic factors predictive of disparities in earnings after spinal cord injury, *Archives of Physical Medicine and Rehabilitation* **87** (2006), 1318–1326.
- [53] R. Levi, C. Hultling and A. Seiger, The Stockholm spinal cord injury study: 4. Psychosocial and financial issues of the Swedish annual level-of-living survey in SCI subjects and controls, *Paraplegia* **34** (2006), 152–157.
- [54] S. Lotta, M. Nora, M. Boselli, R. Bocchi and D. Nicolotti, Family, vocational and social reintegration of spinal cord injured patients following discharges from a rehabilitation centre, *Europa Medicophisica* **35** (1999), 49–59.
- [55] C. Lundquist, B. Siösteen, C. Blomstrand, B. Lind and M. Sullivan, Spinal cord injuries: clinical, functional and emotional status, *Spine* **16** (1991), 78–83.
- [56] E.J. Mackenzie, S. Shapiro, R.T. Smith, J.H. Siegel, M. Moody and A. Pitt, Factors influencing return to work following hospitalization for traumatic injury, *American Journal of Public Health* **77** (1987), 329–334.
- [57] S. McShane and J. Karp, Employment following spinal cord injury: A covariance structure analysis, *Rehabilitation Psychology* **38** (1993), 27–40.
- [58] M.A. Meade, A. Lewis, M.N. Jackson and D.W. Hess, Race, employment, and spinal cord injury, *Archives of Physical Medicine and Rehabilitation* **85** (2004), 1782–1792.
- [59] G. Murphy, D. Brown, J. Athanasou, P. Foreman and A. Young, Labour force participation and employment among a sample of Australian patients with spinal cord injury, *Spinal Cord* **35** (1997), 238–244.
- [60] G.C. Murphy and A.E. Young, Employment participation following spinal cord injury: relation to selected participant demographic, injury and psychological characteristics, *Disability and Rehabilitation* **27** (2005), 1297–1306.
- [61] G.C. Murphy, A.E. Young, D.J. Brown and N.J. King, Explaining labor force status following spinal cord injury: the contribution of psychological variables, *Journal of Rehabilitation Medicine* **35** (2003), 276–283.
- [62] W.S. Nef, Rehabilitation and work, in: *Rehabilitation Psychology*, W.S. Nef, ed., Washington: American Psychological Association, 1971, pp. 109–142.
- [63] L. Noreau, S.-A. Dion, J. Vachon, M. Gervais and M.-T. Laramée, Productivity outcomes of individuals with spinal cord injury, *Spinal Cord* **37** (1999), 730–736.
- [64] L. Noreau, P. Fougeyrollas, M. Post and M. Asano, Participation after spinal cord injury: The evolution of conceptualization and measurement, *Journal of Neurological Physical Therapy* **29** (2005), 147–156.
- [65] L. Noreau and R.J. Shephard, Return to work after spinal cord injury: the potential contribution of physical fitness, *Paraplegia* **30** (1992), 563–572.

- [66] L. Noreau, Évolution de la situation des blessés médullaires au Québec, *Canadian Journal of Rehabilitation* **6** (1992), 33–44.
- [67] J. Pelletier, *L'intégration au travail des personnes handicapées soutenues par les établissements sociosanitaires*, Québec: OPHQ, 1998.
- [68] C. Pflaum, G. McCollister, D.J. Strauss, R.M. Shavelle and M.J. DeVivo, Worklife after traumatic spinal cord injury, *The Journal of Spinal Cord Medicine* **29** (2006), 377–386.
- [69] A.C. Pinkerton and M.L. Griffin, Rehabilitation outcomes in females with spinal cord injury: a follow-up study, *Paraplegia* (1983), 166–175.
- [70] R.W. Rice, J.P. Near and R.G. Hunt, The job satisfaction-life satisfaction relationship: a review of empirical research, *Basic Applied Social Psychology* **1** (1980), 37–64.
- [71] P.R. Sandford, D.J. Falk-Palec and K. Spears, Return to school after spinal cord injury, *Archives of Physical Medicine and Rehabilitation* **80** (1999), 885–888.
- [72] M.C. Schonherr, J.W. Croothoff, G.A. Mulder, T. Schoppen and W.H. Eisma, Vocational reintegration following spinal cord injury: expectations, participation and interventions, *Spinal Cord* (2004), 177–184.
- [73] R. Schulz and S. Decker, Long-term adjustment to physical disability: the role of social support, perceived control, and self-blame, *Journal of Personality and Social Psychology* **48** (1985), 1162–1172.
- [74] L.R. Shaw and B.T. McMahon, Jobs obtained by spinal cord injured rehabilitants: implications for job placement practices, *Journal of Applied Rehabilitation Counseling* **16** (1985), 48–51.
- [75] J. Sherman, D. DeVinney and K. Sperling, Social support and adjustment after spinal cord injury: Influence of past peer-mentoring experiences and current live-in partner, *Rehabilitation Psychology* **49** (2004), 140–149.
- [76] B. Siösteen, C. Lundqvist, C. Blomstrand, L. Sullivan and M. Sullivan, The quality of life of three functional spinal cord injury subgroups in a Swedish community, *Paraplegia* **28** (1990), 476–488.
- [77] S. Srivastava and A. Chamberlain, Factors determining job retention and return to work for disabled employees: a questionnaire study of opinions of disabled people's organizations in the UK, *Journal of Rehabilitation Medicine* **37** (2005), 17–22.
- [78] S.L. Stover and P.R. Fine, *Spinal Cord Injury: The Facts and Figures*, Birmingham: University of Alabama at Birmingham, 1986.
- [79] M. Taricco, C. Colombo, R. Adone, G. Chiesa, C.S. Di, M. Borsani et al., The social and vocational outcome of spinal cord injury patients, *Paraplegia* **30** (1992), 214–219.
- [80] T. Tasiemski, E. Bergstrom, G. Savic and B.P. Gardner, Sports, recreation and employment following spinal cord injury: a pilot study, *Spinal Cord* **38** (2000), 173–184.
- [81] D.G. Tate, C.Z. Kalpakjian and M.B. Forchheimer, Quality of life issues in individuals with spinal cord injury, *Archives of Physical Medicine and Rehabilitation* **82** (2002), s18–s25.
- [82] P.C. Tomassen, M.W. Post and F.W. van Asbeck, Return to work after spinal cord injury, *Spinal Cord* **38** (2000), 51–55.
- [83] R.B. Trieschman, *Spinal Cord Injury: Psychological, Social and Vocational Rehabilitation*, (2 ed.), New York: Demos, 1988.
- [84] D. Unger and J. Kregel, Employers' knowledge and utilization of accommodations, *Work* **21** (2003), 5–15.
- [85] K. Valtonen, A.K. Karlsson, H. Alaranta and E. Viikari-Juntura, Work participation among persons with traumatic spinal cord injury and meningomyelocele, *Journal of Rehabilitation Medicine* **38** (2006), 192–200.
- [86] I. Ville and F. Ravaut, Work, non-work and consequent satisfaction after spinal cord injury, *International Journal of Rehabilitation* **19** (1996), 241–252.
- [87] I. Ville and J.F. Ravaut, Work values: a comparison of non-disabled persons with paraplegia, *Disability and Rehabilitation* **20** (1998), 127–137.
- [88] I. Ville and M. Winance, To work or not to work? The occupational trajectories of wheelchair users, *Disability and Rehabilitation* **28** (2006), 423–436.
- [89] L.C. Vogel, S.J. Klaas, J.P. Lubicky and C.J. Anderson, Long-term outcomes and life satisfaction of adults who had pediatric spinal cord injuries, *Archives of Physical Medicine and Rehabilitation* **79** (1998), 1496–1503.
- [90] R.T. Walls, C. Masson and T.J. Werner, Negative incentives to vocational rehabilitation, *Rehabilitation Literature* **38** (1977), 143–150.
- [91] R.Y. Wang, Y.R. Yang, L.L. Yen and F.K. Lieu, Functional ability, perceived exertion and employment of the individuals with spinal cord lesion in Taiwan, *Spinal Cord* **40** (2002), 69–76.
- [92] N. Watson, Spinal cord injury in the female, *Paraplegia* **21** (1983), 143–148.
- [93] P. Wehman, K. Wilson, W. Parent, P. Sherron-Targett and W. McKinley, Employment satisfaction of individuals with spinal cord injury, *American Journal of Physical Medicine and Rehabilitation* **79** (2000), 161–169.
- [94] C.D. Weidman and A.A. Freehafer, Vocational outcome in patients with spinal cord injury, *Journal of Rehabilitation* **47** (1981), 63–65.
- [95] F. Woodrich and J.B. Patterson, Variables related to acceptance of disability in persons with spinal cord injuries, *Journal of Rehabilitation* **49** (1983), 26–30.
- [96] S. Yasuda, P. Wehman, P. Targett, D.X. Cifu and M. West, Return to work after spinal cord injury: A review of recent research, *NeuroRehabilitation* **17** (2002), 177–186.
- [97] G. Yavuzer and S. Ergin, Productivity of patients with spinal cord injury in Turkey, *International Journal of Rehabilitation Research* **25** (2002), 153–155.
- [98] A.E. Young and G.C. Murphy, Spinal cord injury rehabilitation outcomes: a comparison of agricultural and non-agricultural workers, *Australian Journal of Rural Health* **6** (1998), 175–180.
- [99] A.E. Young, R. Strasser and G.C. Murphy, Agricultural workers' return to work following spinal cord injury: a comparison with other industry workers, *Disability and Rehabilitation* **26** (2004), 1013–1022.
- [100] J.S. Young, P.E. Burns, A.M. Bowen and R. McCutchen, *Spinal Cord Injury Statistics: Experience of the Regional Spinal Cord Injury Systems*, Phoenix: Good Samaritan Medical Center, 1982.
- [101] M. Young and W. Alfred, Vocational status of persons with spinal cord injury living in the community, *Rehabilitation Counselling Bulletin* **37** (1994), 229–244.