




# A Narrative Review of Vocational Rehabilitation in People with Spinal Cord Injury in Different Countries

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## Abstract

**Background:** Spinal cord injury (SCI) is a life-long neurological disease. This study reviews the literature on the vocational rehabilitation (VR) of people who experience SCI.

**Methods:** MEDLINE (via PubMed), Web of Science, EMBASE, Google Scholar, ProQuest, and Science Direct databases were searched. The inclusion criteria of the articles included the following: describing adults with SCI only, the English or Persian language, and involving people of workforce age. Conference abstracts, case studies, and editorials were excluded.

**Results:** The eligibility of 186 full-text articles was assessed, and 124 studies met the inclusion criteria. Most studies focused on barriers and facilitators for work in people with SCI.

**Conclusion:** There are no current services and programs in Iran that support post-injury employment of people with SCI, and therefore, there remains a need for studies addressing employment in this population.

**Keywords:** Return to Work, Spinal Cord Injuries, Vocational Rehabilitation

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## Introduction

Employment is important for anyone who is of working age because it provides purpose and order, causes financial independence and self-esteem, and plays a fundamental role in the formation of a person's identity. Returning to work after a chronic illness increases the quality of life and well-being of a person and is related to physical and mental health. In addition, it promotes social participation and productivity and helps the economy of the society. Improving return to work (RTW) rates for people with acquired disabilities is both important and complex (1). One of the methods that can be used to facilitate the RTW of people with chronic diseases is vocational rehabilitation (VR). VR includes a set of activities focused on the employment or

RTW of persons with disabilities. It is a dynamic process with activities and actions following the logical, sequential progression of services associated with the disabled person's total needs. It is initiated with the initial case finding or referral and terminated with the individual successful placement in employment. While general rehabilitation focuses on facilitating the functional recovery from injury or illness to its original state possible, VR's objective is restoring the work capacity and consists of a range of techniques that could effectively help disabled workers' RTW, job retention, or find new employment (2).

Spinal cord injury (SCI) is a life-long neurological disease causing complete or incomplete sensory or motor

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### ↑What is "already known" in this topic:

Vocational rehabilitation (VR) is a process that enables persons with functional, psychological, developmental, cognitive, and emotional disabilities, impairments or health disabilities to overcome barriers to accessing, maintaining, or returning to employment or other useful occupations.

### →What this article adds:

Vocational rehabilitation (VR) is necessary as soon as possible after the injury onset and implementation of an early VR program has a good potential to increase the probability of participation in work. There are no current services and programs in Iran that support post-injury employment of people with SCI.

function impairment below the lesion level. People with SCI experience significant changes in their physical status, functional capacity, and level of independence. Currently, due to the advances made in the field of medicine and rehabilitation, we are witnessing an increase in the survival rate and life expectancy of people with SCI (3). Based on statistics, ~282,000 Americans with SCI have many long-term medical complications and need rehospitalization and extensive medical care (4). The prevalence of SCI in Iran has been estimated to be 318 per million (5). SCI significantly affects the economic status of the patients because most SCI patients are of working age (6). Due to the effects on different body systems as well as the requirement for constant vigilance to avoid additional secondary complications, SCI is associated with high costs. The main concern is the direct cost associated with medical care, but there are indirect costs associated with the loss of jobs and income (7). The employment rate of people with SCI is different widely because of differences in the employment definition and the time used to assess the outcome after injury (8). The employment rate in people with SCI is very low compared to healthy people. The obtained data shows that about 60% of cases with SCI are employed pre-injury. However, only nearly 30% are employed after rehabilitation from injury (9).

After an SCI, many patients are highly concerned about sustainable employment outcomes. Employment after injury provides a daily structure for distracting from disability and pain, regardless of whether the patients return to their previous positions or deal with a new employer (10). According to a recent review by Anderson and colleagues, there are several factors related to employment after SCI, including employment type, time since injury, social support, the severity of the lesion, environment, education, age, gender, marital status, vocational counseling, employer attitudes, race, medical conditions, and psychologic state (11). In addition to various factors that facilitate return to work, there are several 'barriers' to returning to work for SCI patients. Physical factors, like pressure ulcers, bowel and bladder incontinence, fatigue, and/or medical conditions needing re-hospitalization, prevent sustaining employment of a person with SCI. Psychological and psychosocial status, not being able to drive and a lack of independence in mobility were other factors identified as barriers to employment (12).

As we know, RTW is the most recognized marker of successful rehabilitation and employment is a goal of many rehabilitation settings. Being employed post-SCI is a sign to self and others of living a normal life and it can improve the quality of life and create a sense of control over the environment, which is the ultimate goal of rehabilitation. However, there are limited interventions concerning VR for SCI cases that have been described and evidence of their effectiveness in SCI is lacking. Data on existing interventions and models to enhance vocational reintegration in SCI are needed to develop a VR model based on contextual characteristics aiming at a maximal employment rate. Therefore, the purpose of this paper is to summarize scientific knowledge on VR of persons who experienced SCI based on the literature review. Consideration was focused on VR

in general and on the employment of persons with SCI in particular.

In fact, with attention to the increase in the number of people with SCI in Iran due to natural disasters such as floods and earthquakes, road accidents, and work-related injuries, and considering that the ultimate goal of rehabilitation is to improve the quality of life of these people, this question arises, "Is there a specific pattern or model to guide the employment of people with SCI in Iran?" Therefore, it seems that examining the status of employment and VR of people with SCI will be helpful in answering this question.

## Methods

This narrative review study was performed to identify relevant studies of VR in people with SCI. The narrative type of review was chosen because we aimed to summarize earlier publications and to include all SCI etiologies and types to offer an unbiased review of SCI research. Therefore, this study aimed to answer the question, "What is the current knowledge on VR in people with SCI?" The review was conducted in three steps to answer the study's aim. The first step involved identifying relevant studies, the second step was study selection, and lastly, collating, summarizing, and reporting results were undertaken (13).

### Eligibility criteria

We selected studies published since 2010. Studies were included if describing adults with SCI only, written in the English or Persian language, and involving people of workforce age. Exclusion criteria include conference abstracts, case studies and editorials, articles in which the subjects were not primarily of workforce age or had co-morbidity of other neurological disorders, studies not published in English or Persian, and literature where full-text versions are not available or obtainable.

### Information sources

Studies were identified using systematic literature searches in MEDLINE (via PubMed), Web of Science, EMBASE, Google Scholar, ProQuest, and ScienceDirect.

### Search strategy

The search process was pre-planned and followed a comprehensive search of all suitable studies using appropriate combinations of terms identified in the databases. Searching was completed by the combination of terms associated with spinal cord injury, like "spinal cord injury" OR "spinal cord compression" OR "central cord syndrome" OR "SCI" with those related to vocational rehabilitation, such as "vocational rehabilitation" OR "supported employment" OR "VR". Using such terms, six databases were searched for studies related to the aim of the review. The keywords, titles, and abstracts were selected in all six databases. Figure 1 presents the search and selection process.

The studies were entered into an electronic reference manager, in which duplicate studies were removed. Studies were selected separately by two reviewers (FF and AY), and a third reviewer (NA) resolved disagreements. Study selection was done in two phases. First, abstracts and titles

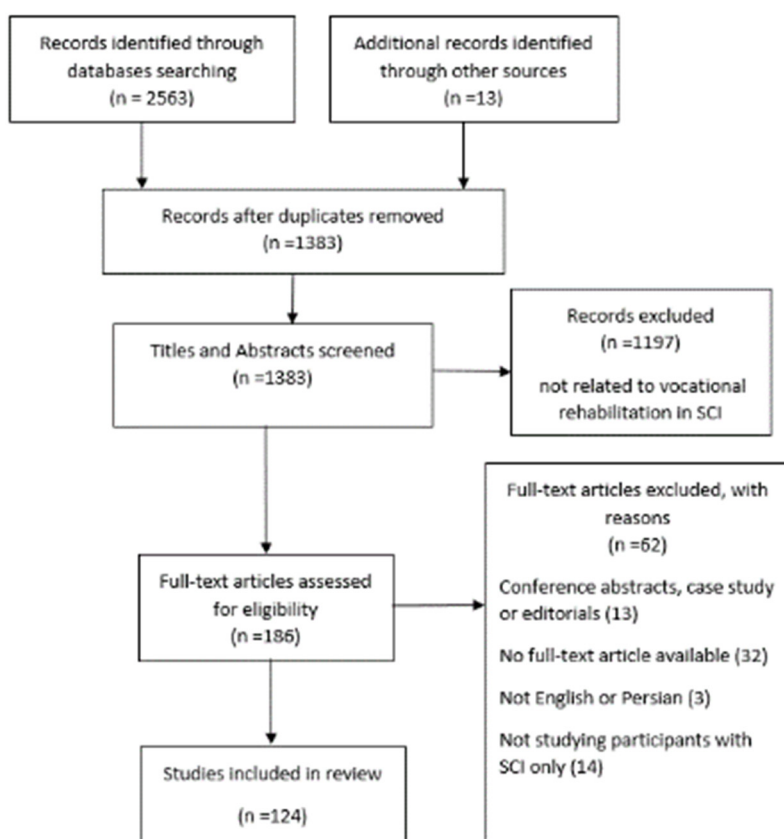


Figure 1. Flow chart of the selection process. n=number.

were screened and related studies were retrieved. Then, we screened the eligibility of the full texts. Following the retrieval of full texts and review of articles considering the selection criteria, reference lists were hand-searched for more suitable papers.

## Results

A total of 2576 studies were extracted for screening the titles and abstracts. After the removal of duplicates and irrelevant papers, 186 studies underwent full-text screening, of which 14 were excluded from studying participants with SCI only and 13 were conference abstracts, case studies, or editorials. For 32 eligible papers, no full text was obtained, and three articles were not described in Persian or English. Hence, 124 cases were finally included.

Studies were published since 2010 to date, with the majority from the US (n=44). The remaining papers were from Australia (n=23), Switzerland (n=12), Netherlands (n=6), Sweden (n=5), Canada (n=5), Norway (n=3), Malaysia (n=3), India (n=3), Bangladesh (n=3), South Africa (n=3), New Zealand (n=2), Italia (n=1), Germany (n=1), England (n=1), Russia (n=1), Serbia (n=1), Brazil (n=1), Iran (n=1), Taiwan (n=1), Singapore (n=1), South Korea (n=1), Indonesia (n=1) and Saudi Arabia (n=1).

The studies were conducted using cross-sectional (42), qualitative methods (26), cohort methods (18), review types (18), randomized control trials (10), and mixed methods (10).

Most studies focused on barriers and facilitators for work in people with SCI, with others on the prevalence of RTW, pathways of employment, models of employment, and VR.

After reviewing 124 studies that met inclusion criteria, they were categorized into four sections:

Employment (47), models of employment (17), vocational rehabilitation (21), and Barriers and facilitators (39).

Therefore, based on this categorization, the articles and the relevant discussion were classified.

## Discussion

We provided an overview of VR in cases with SCI based on the literature review.

As mentioned above, the obtained articles were classified into four sections, which will be briefly explained in terms of the articles placed in each section.

## Employment

The studies included in this section are mainly qualitative, and some of them examine the rate of RTW of cases suffering from SCI in different countries, the effect of various factors such as gender on the level of employment, and the issues experienced by these people in the RTW path, and the experience of experts in supporting the RTW process have been discussed.

Based on the results of the studies, the employment rate

in people with SCI was low compared to the normal population. On the other hand, the rate of RTW in cases suffering from SCI in different countries varied from 13.8% to 67%, which can be attributed to the definition of employment in the studies. Notably, the important point in this section was the higher percentage of employment of people with SCI in studies conducted in some Asian countries such as India and Malaysia, the main reason being weak financial support from government organizations (10, 14, 15).

Some studies investigate the impact of employment on health-related quality of life and suggest that employment has a positive effect on an individual's ability to participate in social relationships, move about their home and community, and spend time in productive and usual roles (16). Furthermore, the benefits of employment are multifaceted and go beyond monetary compensation (17).

On the other hand, there were studies that investigated the effect of various factors, such as hope on the employment of people with SCI and based on the results, it was stated that hope is a significant mediator of the relationship between attachment and full-time employment and hope-based interventions should be considered by VR counselors working with individuals with SCI (9).

Regarding the effect of gender on the employment rate in different countries, according to most of the studies conducted, the difference between the two sexes was insignificant, and only in the studies conducted in the Netherlands and South Korea was the employment rate of women reported to be lower than that of men (18, 19).

Another point is that in most of the studies in this sector, the employment rate of young people was higher than that of people who were older at the time of the injury, but in the study conducted in South Korea, the opposite was true, due to the lack of complete job skills by young people and the need for more time to acquire these skills. It was also stated in this study that the rate of employment in people who have had a longer period since their injury is more than people who have had a shorter period since their injury. This finding was in contrast with those of the earlier studies because, in most of the studies, a longer duration was reported after the injury, hence lowering the likelihood of employment. It should be mentioned that in the study conducted in South Korea, the reason for the higher employment rate in people who had a longer period since their injury was the need in people with SCI for time to adapt to their injury (19).

Several studies included in this section investigated the challenges of employment after suffering from an SCI, based on the results of which the pathways of return to work were reported, including stable employment, unstable employment, and no employment (20-23).

Another section of this article is the examination of the stability of the vocational interests of people with SCI over time, based on the results of which the vocational interests of these people remained relatively constant (24, 25).

Another remarkable finding in the review of articles on employment was that returning to pre-injury work left people with SCI with a shorter time between the injury and re-employment. In addition, most of the people who, in the follow-up studies, were reported still working included

people who had returned to their pre-injury job and continued to work for their former employer, and their earnings were significantly higher than those who had not returned to their former job (26).

### *Models of employment*

Most of the studies in this field include randomized controlled trials that compare the supported employment program with usual treatment. Importantly, most of these studies were conducted in the US, so 9 out of the 17 articles included in this section are related to this country.

Based on the results of these studies, the supported employment program was more effective in different periods compared to treatment as usual for the RTW of people with SCI. Furthermore, the people who participated in the supported employment program were significantly more likely to RTW (2.5 times) compared to the usual treatment group (27, 28). On the other hand, considering that the cost-effectiveness of these programs has been proven in various studies in the same sector, there was a greater desire to use them from the providers of these programs and insurance companies for people with SCI (29, 30).

It should be noted that in some studies of this section, a special model of supportive employment called Individual Placement and Support (IPS) was used. The results of these studies showed the superiority of this program over conventional treatment in improving employment outcomes for people with SCI. In addition, the participants in this program who were competitively employed reported improvement in their physical condition and quality of life (31, 32).

### *Vocational rehabilitation*

Most of the articles in this section include studies conducted in Australia, so out of 21 articles in this section, 7 are related to this country. The majority of the mentioned studies investigated the effect of early access to VR for people with SCI, based on the results of which implementing VR is necessary as soon as possible after the injury onset and that the implementation of early VR programs for inpatient people is possible and has a good potential to increase the probability of participation in work. In addition, early access to the VR program was suitable, important, and valuable from the patients' point of view, and early involvement in this program boosted hope in the participants (33-35). Also, vocational services that actively engage people with SCI in job seeking and acquisition and that provide on-the-job support are more likely to lead to employment than general vocational counseling that involves only job preparation (36).

In one study conducted in Australia, an early VR model was used for people with SCI called Back2work, which includes a strong focus on maintaining and strengthening the occupational bond between the injured worker and employer to create a positive expectation of RTW and increase the rate of RTW after SCI. Findings showed the positive effect of this program on returning to work and creating a sense of hope and health in the participants (37).

Based on the studies in this section, there is ample evidence of the potential of early VR interventions in people with SCI, but there are still questions regarding the best

time for vocational interventions after SCI. On the other hand, the time and content of VR programs for people with SCI vary across countries, which can lead to differences in participation in the work of these people (38).

One study conducted in Saudi Arabia to identify the awareness of VR in people with SCI showed that VR awareness among SCI male patients is lacking and should be addressed to overcome unemployment and improve the quality of life (39).

It should be noted that two articles were found in the field of VR in Iran, one of which met the inclusion criteria in this study and was included in this section. In the mentioned study, the sources of VR were examined from the point of view of people with SCI and service providers. The participants in this study mentioned knowledge about themselves and their jobs as the main sources regarding VR (40).

#### **Barriers and facilitators of returning to work**

In the barriers and facilitators section, as expected, most studies examined the facilitators and barriers experienced by people with SCI in different countries on the way back to work and also the relationship between these factors and participation in work. Based on them, people identified things like health conditions and physical problems caused by injuries such as pain, bedsores, bladder and bowel incontinence and environmental factors such as lack of access due to architectural barriers, stigma, limited institutional support and services and discrimination as the most important obstacles to RTW (41-43).

On the other hand, in most studies in this section, individual motivation and attitude were mentioned as major facilitating the RTW, along with other factors such as adaptation to disability, functional independence, especially the ability to drive, understanding the importance of work and social participation, and family and social organizations support. Also, the employer's positive attitude was another influential factor in the RTW of people with SCI (44-46) and both employed and non-employed people with SCI believed that employers discriminate against wheelchair users (47).

In addition, the results of the studies showed that practitioners could play an important role as facilitator in the RTW of people with SCI (44), and a comprehensive multidisciplinary rehabilitation program, which targets vocational goals, is important for successful employment outcomes (46).

What attracted attention by examining these studies was the similarity of obstacles experienced by people with SCI in different countries on the way to RTW.

Also, in some studies, young age at the time of injury, having a high level of education, and being single were regarded as predictive factors of returning to work by the participants in these studies (48, 49). In addition, it was reported that ambulatory participants had higher odds of employment than those with the most severe SCI (50).

The noteworthy point was that in most studies, being married was mentioned as an obstacle and being single as a facilitating factor of returning to work, while in a study conducted by the author himself in Iran entitled "Perceived the

lived experience of people with SCI in the process of returning to work", being married was mentioned as one of the factors facilitating the RTW by the participants in the study (51).

#### **Study limitations**

Some limitations warrant consideration. First, our search terms did not capture publications written in a language other than English or Persian or studies not indexed in the examined databases. Therefore, we tried to ensure a comprehensive search, including searching the reference lists of all available reviews and selected studies. We could not assess the quality of studies given the heterogeneity of the method.

#### **Conclusion**

Several people with SCI, despite their disability, have the potential and want to RTW; however, employment rates among them are much lower compared to the general population. On the other hand, the benefits of employment for these people are well documented regarding reduced depression, greater life satisfaction, improved social integration, improved QOL, a better sense of subjective well-being, enhanced independence, and longevity. Most of the studies are related to the barriers and facilitators of employment in people with SCI, and there are few studies in the field of interventions and specific models to guide the RTW of people with SCI. Therefore, the results are mostly according to evidence from observational studies, which makes it difficult to establish causality, e.g., whether VR improved employment outcomes or if the cases were more interested in gaining employment participating in VR.

On the other hand, the review of the literature revealed that there is not any model of employment for SCI in Iran that, based on study results fits contextual characteristics, while some countries developed models that specifically target employment in people with SCI. However, due to the existing differences in the context of access to public transportation, social services and support, VR programs, and employment opportunities for people with SCI, it does not seem logical to use common models of other countries. Therefore, further studies are needed to address employment in SCI to design a new model of employment or VR for this population in Iran.

#### **Authors' Contributions**

Study concept and design: F. F., SA. H and N. A.; analysis and interpretation of data: F. F., and A. Y.; drafting of the manuscript: F. F. and N. A.; critical revision of the manuscript for important intellectual content: SA. H., N. A., and A. Y.

#### **Ethical Considerations**

Ethical approval is not necessary for this type of study.

#### **Acknowledgment**

Not applicable.

**Conflict of Interests**

The authors declare that they have no competing interests.

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