

# Interventions to Improve Employment Outcomes for People With Spinal Cord Injuries: a Scoping Review Protocol Using the Donabedian Model

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## Protocol

**Keywords:** Spinal Cord Injury, Vocational Rehabilitation, Employment, Education

**Posted Date:** March 22nd, 2021

**DOI:** <https://doi.org/10.21203/rs.3.rs-323678/v1>

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# Abstract

## Background

Unemployment among persons with spinal cord injury (PWSCI) is high and often leads to poverty (including their families). Modifiable and unmodifiable factors that influence employment among PWSCI are known and are addressed throughout the rehabilitation process. The overall aim of rehabilitation of PWSCI is quality of life and community integration (including employment). Interventions that seek to improve employment outcomes among PWSCI are well documented. However, no integrated reviews clearly describe the resources utilised, interventions utilised, duration of interventions and the outcomes (and tools used) to improve employment outcomes among PWSCI. Policymakers and rehabilitation professionals require this information to develop models or strategies to improve employment outcomes for PWSCI. This review aims to map evidence on interventions and approaches that aim to enhance the employment of PWSCI.

## Methodology

This review will map evidence on interventions that improve employment outcomes among PWSCI, using the Arksey and O'Malley framework and the Donabedian model as the guiding lens. The first stage includes the development of the research question and will be reviewed throughout the review process. The PCC framework will be utilised to determine the inclusion and exclusion criteria and develop the search terms. Peer-reviewed primary studies will be identified using the Boolean search terms on PubMed, MEDLINE, Ebscohost, Google Scholar, CINAHL, Cochrane databases. Two independent reviewers will identify primary studies and charting data, and one reviewer will act as a supervisor and arbitrator. Data charting tool will be utilised to gather the required information from the selected studies. Nvivo software version 25 will be used to develop themes for summarising and reporting the data. The quality of the courses selected will be evaluated using the Mixed Methods Appraisal Tool (MMAT).

## Discussion

Data from the selected studies will be discussed in relation to the research questions and the Donabedian model. Information gathered from this scoping review will enable policymakers, rehabilitation professionals and other stakeholders to use this as a foundation in an attempt to develop strategies or models that seek to improve employment outcomes among PWSCI. Moreover, a gap in current practice will be identified, and further research needed in the field will be described.

## Background

Spinal cord injury (traumatic or non-traumatic) often results in motor and sensory loss below the level of the lesion, leading to various secondary health conditions and inability to participate in productive life (including employment) [1]. Improved access to healthcare and rehabilitation has led to improved survival rates among people who sustain spinal cord injury [2] and are expected to have longer life expectancies

and participate in all life situations, including employment. A legal framework exists that promote the employment of people with disabilities. Still, unemployment remains high, resulting in people with disabilities (including persons with spinal cord injuries) experiencing high poverty levels. Employment provides PLWSCI to achieve economic self-sufficiency, personal growth, disability adjustment, social integration, life satisfaction and improved quality of life [3,4]. Employment is also associated with higher activity levels, less medical treatment, and mental stimulation. However, it is estimated that the employment rate of PWSCI is 35% compared to 79% non-disabled individuals [5–7]. A recent worldwide employment rate among PWSCI is estimated to be 38% and in South Africa to be 25% [8]. This number is higher in developing countries with a generally low employment rate [9], and it is associated with poverty. Indirect costs associated with loss of income among PWSCI leads to high reliance on government social grants [10]. Loss of employment among PWSCI also results in their families living in extreme poverty. Poverty among PWSCI is primarily due to inadequate or poor access to interventions that aim at creating employment opportunities following rehabilitation.

Factors that affect employment amongst PLWSCI are divided into two categories: non-modifiable and modifiable factors [11]. Non-modifiable personal factors that positively affect return to work are being a male, Caucasian, being young at injury, duration of injury (more extended period after the injury), higher education pre-injury, and type of pre-injury work. Non-modifiable personal factors that negatively affect return to work in an individual with SCI is the severity of the injury [11]. Modifiable personal factors that positively influence return to work are education/training post-injury, high level of functional independence (including wheelchair skills), internal locus of control, and positive expectations towards work and access to transport, while secondary health conditions affected to return to work negatively [12]. Access to appropriate assistive technology as part of vocational rehabilitation plays a positive role in promoting employment post-SCI, while employer and fellow employees' negative attitudes negatively affect [3,12]. The restoration of function can address both modifiable and non-modifiable factors through multidisciplinary interventions that promote employment outcomes.

Rehabilitation is a course of action aimed at enabling people with disabilities to reach and maintain their optimal physical, sensory, intellectual, psychological, and social functional levels (including economic participation) [13]. One of the most important rehabilitation goals is to return PLWSCI to gainful employment so that they may become integrated into their communities through vocational rehabilitation [14,15]. Vocational rehabilitation (VR) is a multidisciplinary rehabilitation strategy that aims at enabling a disabled person to secure, retain and advance in suitable employment [16,17]. VR is concerned with supporting efforts made by a person with a disability to return to and maintain employment and includes vocational guidance and training, placement, employment, and other related services [16]. The authors further explained that VR typically begins with evaluating the person's functional limitations, barriers to employment, transferable skills, career interests and prior achievement. It might also include an assessment of performance during simulated or actual work. The assessment might be followed by counselling and support concerning educational or vocational re-entry, job accommodation, and supported employment. Educational or vocational re-entry is often facilitated by a rehabilitation

counsellor who can liaise with employers, most of whom have little experience interacting with persons with disability and can have difficulty imagining how a person with an SCI could perform a specific job.

In KwaZulu-Natal (one of the largest provinces in South Africa), two major centres render acute care for SCI management and one sub-acute care facility owned and managed by the government. There are limited interventions that seek to improve employment and education outcomes for PWSCI in all facilities. To incorporate the interventions mentioned above in SCI's overall rehabilitation in KwaZulu-Natal, researchers and policymakers should identify interventions and approaches that seek to improve employment outcomes through the synthesis of existing knowledge. Two systematic reviews were published that identified interventions that seek to improve employment outcomes among PWSCI [18,19]. However, these reviews only focused on the interventions utilised and their effectiveness. To develop a vocational rehabilitation programme in a low resource community, an in-depth analysis of the available literature that focuses on the structure, process and outcomes of the interventions is required.

The theoretical frameworks that underpin this review are based on the Donabedian model and the international classification of functioning and health (ICF). The Donabedian model provides a comprehensive framework to evaluate the quality of healthcare services systematically. It has been used in healthcare systems research and the various healthcare setting (including rehabilitation) for the past two decades [20,21].

This model distinguishes three linked categories of healthcare information: structure, process, and outcomes (SPO). It is emphasised that all three components should be examined when evaluating healthcare services and being treated equally [20,21]. Structure of rehabilitation refers to the type of facility, resources, and systems (beds, modified wards); qualified professionals including speciality (physiotherapist, occupational therapist, and vocational therapist) education, training, and experience, as well as a staff-bed ratio; and unique medical and technical equipment for patients with SCI [22]. The process as a transactional nature of providing and receiving care involving both providers and recipient of care. In rehabilitation, the process of care involves diagnosis, treatment, therapy, prevention activities, patient education activities, social support, and discharge plan [22]. Outcomes of rehabilitation refer to changes resulting from rehabilitation interventions (process), including patient knowledge improvements, health status and behaviour, and patient satisfaction. Patient outcomes in rehabilitation include improvements in functioning and level of support required post-discharge (community integration) [22]. This model will be used in this review to develop the research questions and identify the structure, process, and outcomes of the interventions or approaches identified. Information related to the structure (teams involved, resources utilised) will be identified; specific interventions utilised and their contexts (process) will also be included. Outcomes of the interventions, as mentioned above, will be outlined, as well as the specific outcome measurement tools utilised. Interventions and patient outcomes can be further described using the international classification of function, disability, and Health (ICF).

The ICF is a framework used to holistically assess the impairments, activity limitations and participation restrictions in an individual with a disease or injury (WHO: 2002). This framework helps rehabilitation

professionals establish the interaction of these domains with the environment to develop appropriate rehabilitation interventions. In this review, the ICF will guide the identification of variables related to the process of care and patient outcomes. The data extraction tool will collect information related to the body structures and functions affected, activity and participation limitations (with specific reference to economic participation) during rehabilitation and following rehabilitation. Furthermore, environmental and personal factors will be identified that affect the economic participation of PLWSCI. Therefore, the purpose of this scoping review is to map and identify and describe rehabilitation interventions that aim to improve employment outcomes for PWSCI using the Donabedian model and the ICF. The information gained in this review will partially inform the development of a model that intends to guide employment outcomes for PWSCI in the study setting [1].

## Methodology

### *Study Design*

This protocol forms part of a doctoral study that the Biomedical Research Ethics Committee approved at the University KwaZulu-Natal (BE499/14), registered with the ClinicalTrials.gov NCT02582619; <https://clinicaltrials.gov/ct2/show/NCT02582619> (Archived by WebCite at <http://www.webcitation.org/6mBgcj6z7>), and the KwaZulu-Natal Department of Health (HRM 185/15). This protocol is being reported following the reporting guidance provided in the Preferred Reporting Items for Systematic Reviews and Meta-analyses Protocols (PRISMA-P) statement [23] and the PRISMA extension for scoping reviews (PRISMA-ScR) [24]. It will review the literature on interventions aimed at improving employment outcomes for PWSCI (adults). This review will utilise a six-stage scoping methodology described by O'Malley and Arksey and further developed by Levac et al. [25,26]. Therefore, this review will use the following steps: the first stage is to identify research questions (1), followed by identification of the relevant studies (2), selection of eligible studies (3), charting the data (4) collating, summarising, and reporting the results (5) and consulting with relevant stakeholders (6). The Donabedian model was utilised to develop and structure the research questions, identifying variables and concepts to be explored when charting the data. Deductive thematic analysis will be used to analyse or chart the data according to the Donabedian model's components (structure, process, and outcomes).

### *Development of Research Question(s)*

The Donabedian model components guided the development of research questions as the reviewers are interested in determining the structure, process, and outcomes of interventions that seek to improve the employment outcomes in persons with spinal cord injuries (PWSCI). This information will be necessary to plan these interventions in resource-limited contexts.

### *Main Research Question*

- What is the structure, process and outcomes of rehabilitation interventions that seek to improve the employment and education outcomes among persons with spinal cord injuries?

### *Sub-Research Questions*

- What is the definition of employment utilised in studies that seek to improve employment outcomes among PWSCI?
- What is the structure (appropriate setting, providers of care, resources required) of rehabilitation approaches or interventions that seek to improve employment outcomes among PWSCI?
- What is the process of rehabilitation approaches or interventions that aim to improve employment outcomes among PWSCI?
- What are the outcomes of rehabilitation approaches or interventions that seek to improve employment outcomes among PWSCI?

An attempt will be made to keep the above research questions broad to summarise the breadth of evidence in vocational rehabilitation in SCI. The above research questions will be revised as the review progresses through the three stages of study selection. Moreover, the research questions mentioned above guided the development of the inclusion criteria (using PCC) to be used to select articles to be included in the review.

### ***Identification of Relevant Studies***

Studies will be identified using the Joana Briggs Institute search guidelines [27]. The following databases will be utilised to search for the literature: Medline via PubMed, Ebscohost (Academic Search Premier, AfricaWide Information, Cinahl, APA PsychInfo), Scopus, Web of Science, Cochrane library with no date limits imposed. This will enable the reviewers to map the breadth of evidence to illustrate a historical perspective. The Boolean terms "AND", "OR", and "NOT" will be utilised to separate keywords. Table 2 depicts a draft search strategy used on PubMed. A further literature search will be done on the World Health Organisation and International Labour Organisation websites. The review team will involve a specialist librarian (Health Sciences) employed by the University of KwaZulu-Natal throughout the review process.

### ***Selection of eligible studies***

Table 1 summarises the inclusion criteria to be utilised in the identification of the relevant studies using the PCC model. Persons with spinal cord injuries (traumatic or non-traumatic) that resulted in motor or sensory loss (complete or incomplete) below the level of the lesion (cervical, thoracic, or lumbar regions of the spine) formed the population to be considered in the selection of articles. Articles that involved concepts related to vocational rehabilitation interventions or approaches that seek to improve the employment outcomes of PWSCI will be included. Employment outcomes in this study have all labour participation outcomes (employment and education). Articles published in various clinical settings (acute, sub-acute or chronic) will be considered and those implemented in rural vs urban environments. Only articles published in English from both developed and developing countries will be considered due to the lack of foreign language interpreters in the study setting.

There will be no year limit as reviewers would like to map the evidence to show what was done in the past and what is currently being done. Table 2 summarises the search strategy developed to select the studies on PubMed. It also indicates the number of titles yielded on the preliminary search. The South African Cochrane Centre was consulted in the development of the search strategy. This phase will be divided into three stages, namely: title phase, abstract phase, and full-text phase. Figure 1 summarises the PRISMA flow chart diagram that will be utilised to indicate the number of articles yielded in each stage. The Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) checklist will also be used to present the results of the study (Figure 2) ([24]. Studies that do not comply with the study PCC will not be included in this review. Commentaries, Opinions, and letters to editors will be excluded.

### *Inclusion Criteria*

Articles or studies eligible for this review must meet the following inclusion criteria:

- Adult persons with spinal cord injury (18 to 65 years)
- Published peer review articles.
- Articles written in English.

### *Exclusion Criteria*

- Commentaries, letters to editors and opinion pieces
- Literature where full-text version is not available or obtainable.

Eligible studies will be uploaded to Rayyan QCRI (<http://rayyan.qcri.org>), a free web and mobile application that will assist with the initial screening (title, abstract and full text) of literature as well as removing duplicates [28]. This application assists reviewers to work independently to achieve a certain level of reliability. Authors (NP and JM) will be responsible for the selection of studies throughout the phases. Any discrepancies between the reviewers will be discussed, and if no consensus or agreement is reached, a third reviewer (SN) will be consulted to make a final decision. Efforts will be made to obtain full texts by search websites, consulting librarians, or even by directly contacting authors. The degree of agreement between reviewers will be calculated and reported using Cohen's kappa coefficient.

### ***Charting of the Data***

A data capturing template (excel) will be utilised to extract relevant information from the selected studies. Table 3 summarises the aspects to be extracted from the selected full-text articles according to the review objections. The following information will be of interest to the reviewers:

- Study characteristics: authors, year of publication, study design, number of participants, country of origin and study setting.
- Population characteristics: population sampled, age (mean and standard deviations or categories), sex (male to female ratios and percentages), level of injury (percentage of cervical, thoracic, and

lumbar regions affected, the severity of the lesion (ASIA or Frankel classification)

- Structure of interventions (Staffing, training of staff, equipment required, technological advances, setting etc.)
- Process of care: Interventions (employment or educational interventions) (type, duration, intensity etc.)
- Outcomes: employment status (permanent or temporary, full-time, or part-time etc.)
- Key findings and conclusions

However, reviewers will continuously review the data extraction tool throughout the process. Two reviewers will independently chart the data, and results will be discussed, and if there are any disagreements, the third reviewer will act as an arbitrator. The Mixed Methods Appraisal Tool (MMAT) will be version 2018 will be utilised to appraise the selected studies. This tool is appropriate as it considers both qualitative and quantitative studies. NP and JM will do the appraisal process, and SN will act as an arbitrator should difference occur.

### ***Collating, summarising and reporting results.***

The data collection will be guided by the research questions, which were formulated using the Donabedian model. The data will be summarised on excel tables under the following themes: Study Characteristics, Structure of Rehabilitation, Process of Rehabilitation and Outcomes of Rehabilitation. Using the international classification of function and disease, the outcomes identified will further be divided into impairments, activity limitation, and participation restrictions (according to the international classification of function and disease).

## **Discussion**

Although there is no cure for spinal cord injuries, medical advances in spinal cord injury management allow people who sustain spinal cord injuries to live longer and are expected to participate in all life situations (including employment). Rehabilitation for PWSCI aims to improve their quality of life and integration into community activities (including labour participation). However, persons with spinal cord injuries (PWSCI) continue to experience extreme poverty due to the low involvement in employment activities. Therefore, there is a need to develop strategies or models that will equalise employment opportunities for PWSCI, thereby improve employment outcomes and livelihood. Information relating to the structure, process, and effects (outcomes) of interventions that seek to improve employment outcomes for PWSCI is needed to serve as a foundation before such strategies or models are developed in low resource setting like South Africa. This scoping review will also inform rehabilitation SCI policies in South Africa and provide rehabilitation professionals access to integrated information to inform practice. Furthermore, this scoping review will inform further studies that seek to improve employment and education outcomes for PWSCI.

# Abbreviations

SCI: Spinal Cord Injury

VR: Vocational Rehabilitation

PWSCl: Persons or People with Spinal Cord Injuries

PCC: Population Concept Context

MMAT: Mixed Methods Appraisal Tool

UKZN: University of KwaZulu-Natal

# Declarations

## Competing Interest:

NP: Nothing to declare

## Acknowledgements

The authors would like to thank the College of Health Sciences (UKZN) Research Office and the National Research Foundation for financial support.

## Authors Contributions

NP, JM and SN conceptualised the study. NP prepared the manuscript under the supervision of JM and SN

## Ethics

## Funding

The University of KwaZulu-Natal funded this study, the College of Health Sciences Research Office and the National Research Foundation (Thuthuka Grant).

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## Tables

Table 1

## Inclusion and Exclusion Criteria

Population	<p>All studies that include persons who sustain spinal cord injury as participants will be included, irrespective of the cause (traumatic or non-traumatic), neurological level (paraplegia or tetraplegia) and severity (complete or incomplete).</p> <p>Only peer-reviewed research articles published in English will be included (no specific time frame). Commentaries, Editors notes, systematic reviews will not be included.</p>
Content	Studies that report on interventions that seek to improve employment and education outcomes.
Context	Studies published in both developed and developing countries will be included. Special attention will be given to studies that identify the stage of rehabilitation (acute or sub-acute or chronic) as well as institution-based (inpatient or out-patient) or community-based.

Table 2

## Proposed Search Strategy (PubMed)

Keywords search strategy	No of titles yielded on PubMed (Results)	Date
(((((Spinal Cord Injuries[MeSH Terms] OR Spinal Cord Compression[MeSH Terms])) OR (Spinal cord injury OR spinal cord injuries OR spinal cord lesion OR spinal cord lesions))) AND (((Vocational rehabilitation[MeSH Terms] OR Vocational Guidance[MeSH Terms])) AND (Vocational rehabilitation OR vocational counselling OR supported employment OR vocational coaching))) AND (((Employment[MeSH Terms] OR Education[MeSH Terms] OR education status[MeSH Terms] OR early intervention[MeSH Terms] OR social participation[MeSH Terms] OR work[MeSH Terms])) AND (Employment OR education OR labor participation OR early intervention OR social participation OR work OR education status))	22	2021-03-10 (Time: 06:33:35)

Table 3

Data Charting Tool

<b>Study Characteristics</b>	Year
	Country
	Authors
	Study design
	Participants (Spinal cord injury)
	Age (means)
	Gender
	Study setting
<b>Structure of Interventions</b>	Team Involved
	Resources utilised
	Training of the team
<b>Process of Interventions</b>	Interventions utilised
	Duration of interventions
<b>Outcomes of Interventions</b>	Outcomes measured (ICF)
	Intervals of measurement

## Figures



## PRISMA 2009 Flow Diagram

Identification

Screening

Eligibility

Included

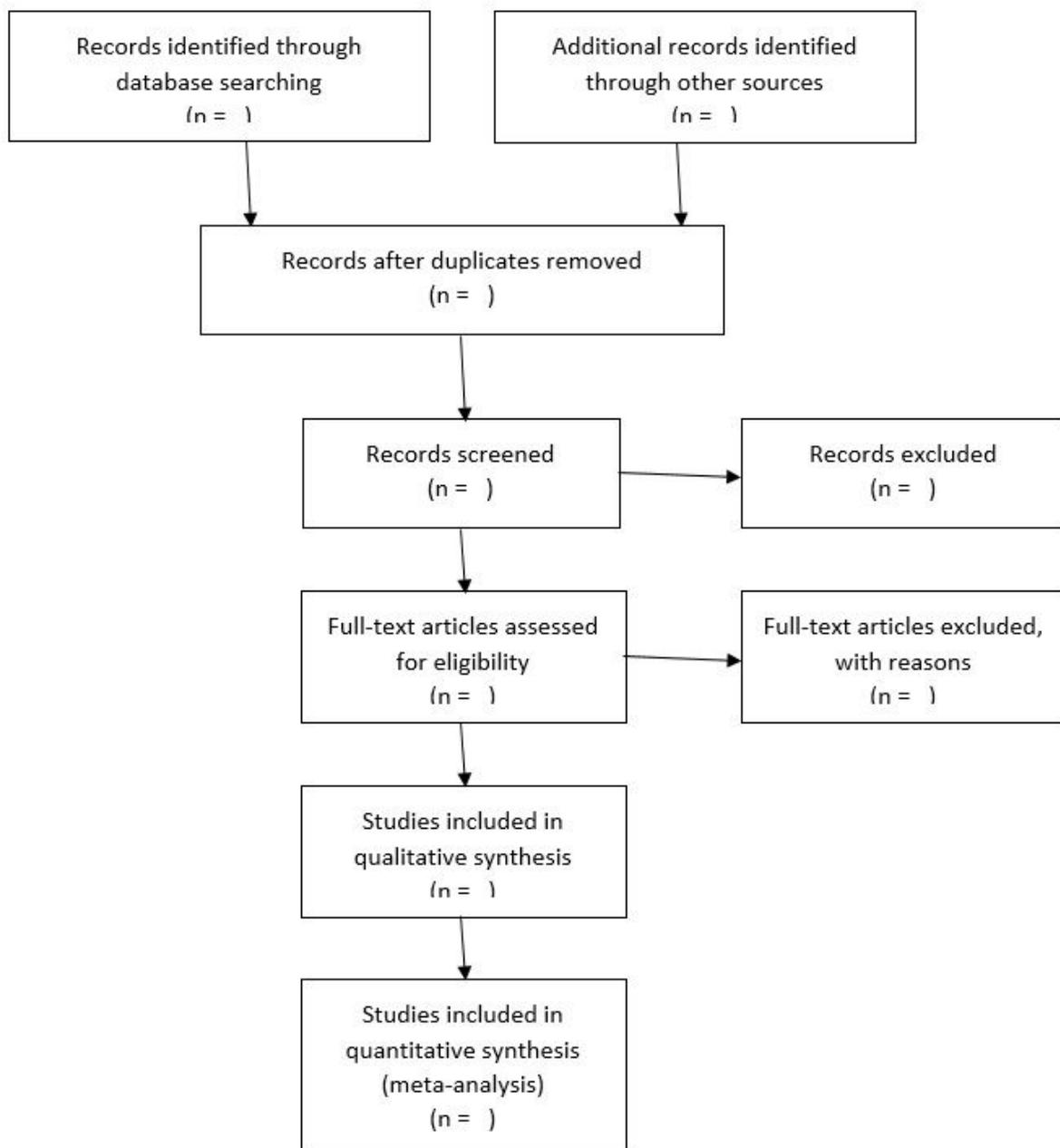


Figure 1

PRISMA Flow Diagram

## Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Figure2PRISMAP2015Checklist.docx](#)