Factors Associated with Return to Work after a Spinal Cord Injury: a Systematic Review and Meta-analysis

by

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Abstract

Background: Individuals with a Spinal Cord Injury (SCI) experience challenges in obtaining and maintaining employment. The overall Return-To-Work (RTW) rate after SCI is lower than the employment rate of the general population. Some factors have been reported in the literature as being associated with RTW after SCI, but there is a need to synthesize results to estimate the strength of association of each significant factor.

Objectives: 1) To identify factors associated with RTW after a SCI, 2) To assess the strength of each factor's association with RTW, and 3) To explore how factors associated with RTW after a SCI vary among High Income Countries (HIC) and Low/Middle Income Countries (LMIC).

Methods: Systematic review and meta-analysis. A comprehensive literature search was conducted in MEDLINE, Embase, CINAHL, PsycINFO and Scopus databases. Search terms included two constructs, 1) "spinal cord injury" and 2) "return to work". All articles discussing RTW after SCI as a key concept were included. Articles were then excluded if the descriptive data were not disaggregated in "employed" and "unemployed" categories or if data were not presented for SCI-only groups. Factors that were reported in three or more articles were included in meta-analyses and subgroup analysis were completed by country's economic status, as determined by the World Bank Classification (i.e. HIC vs. LMIC). A random effect model was used to estimate: 1) Odd ratios for nominal/ordinal factors, and 2) Mean differences for continuous factors with respective corresponding 95% confidence intervals (CI).

Results: We screened 3,834 articles and 52 were included for analysis. Forty-seven studies were from HIC and five from LMIC. We identified 12 factors significantly associated with RTW: A) "body structures and functions" - 1) Being paraplegic (OR: 0.73, 95 % CI: 0.63 to 0.85, medium

quality of evidence), B) "activity limitations" - 2) Ability to live alone (OR: 2.59, 95 % CI: 1.30 to 5.10, low quality of evidence), 3) Ability to drive (OR: 4.76, 95 % CI: 2.94 to 7.61, low quality of evidence), 4) No wheelchair use (OR: 0.44, 95 % CI: 0.20 to 0.96, low quality of evidence), and 5) Higher Functional Independence Measure scores (Mean difference: 0.67, 95 % CI: 0.49 to 0.85, medium quality of evidence), and C) "personal factors"- 6) Being married (OR: 1.54, 95 % CI: 1.06 to 2.23, medium quality of evidence), 7) Being white (OR: 2.16, 95 % CI: 1.54 to 3.03, low quality of evidence), 8) Being younger at the time of data collection (mean difference: -0.24, 95 % CI: -0.38 to -0.11, low quality of evidence), 9) Being younger at the time of injury (mean difference: -0.30, 95 % CI: -0.46 to -0.14, low quality of evidence), 10) More time since injury (mean difference: 0.31, 95 % CI: 0.12 to 0.49, low quality of evidence), 11) ≥ high school education (OR: 0.45, 95 % CI: 0.36 to 0.57, low quality of evidence), and 12) \geq \$20,000 annual income (OR: 0.15, 95 % CI: 0.06 to 0.34, low quality of evidence). No "environmental" factors qualified for meta-analysis. Five factors were included in the subgroup analyses and the following 3 factors were significantly associated with RTW only in HIC: 1) Being paraplegic, 2) Being able to live alone, and 3) Being married.

Conclusions: Being able to drive, Being able to live alone, Being White, Being paraplegic, Having ≥ high school education, Having ≥\$20,000 annual income were the most important factors associated with RTW after SCI. All factors identified as significantly associated with RTW were explored in HIC. There is a paucity of evidence on factors associated with RTW in LMIC so more research is needed in this area. Personal, impairment and activity limitation factors appear to be emphasized over environmental factors in the available literature, and there is a lack of high quality prospective studies in this area.

Keywords: Meta-analysis, return to work, spinal cord injury, systematic review

Preface

This thesis is an original work by Bina Gyawali. This research project does not involve any human or animal participants; therefore ethics approval was not required. A part of this thesis was registered in the PROSPERO database (registration number CRD42022325836).

Dedication

To my parents.

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I am grateful to my M.Sc. supervisor Dr. Adalberto Loyola-Sanchez for providing me with the opportunity to pursue graduate studies along with numerous personal and professional development opportunities. He has demonstrated leadership along with patience, support, and encouragement. Not only did I benefit from his scientific integrity, but I also learned a lot from his academic character.

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Background

Spinal Cord Injury (SCI) is a complex condition resulting in motor, sensory, and autonomic dysfunction leading to devastating impacts on the individual, both socially and economically. The incidence rate of SCI in HIC and LMIC has been reported from 13.1 to 163.4 per million and 13.0 to 220.0 per million people respectively, while the prevalence rates vary from 490 to 526 per million and 440.0 per million people, respectively [1]. A systematic review by Kumar et. al. found that globally, the average age of patients with traumatic SCI is 39.8 (SD \pm 12.2) and the most common mechanism of injury is road traffic accidents followed by falls [2]. These patients typically fall within the working age group (15 to 64 years, inclusive) as defined by global demographics [3]. Participation in productive work is considered as one of the most important factors affected by SCI.

According to the International Classification of Functioning, Disability, and Health (ICF) framework, participation in any area of life, like occupation, is the interaction between the environment and the person who has specific impairments and activity limitations. Therefore, it is important to consider these factors while exploring the phenomenon of return to work (RTW). The ICF is the World Health Organization's (WHO) framework to measure health and disability at individual and population levels [4]. The components of ICF are: Body structure and function, Activity, and Participation, Environmental and Personal factors [5]. The activity and participation components deal with the concept of capacity and performance of a person with a certain health condition [5]. SCI leads to the impairment of motor and sensory function which causes mobility and hand activity limitations, giving rise to participation restrictions by affecting activities of daily life which in turn affects major areas of life, including employment.

Individuals with physical disabilities like SCI experience challenges in obtaining and maintaining employment [6]. RTW following SCI can be of two types: 1) continuing the same job as before injury and 2) starting a new job. RTW rates of people with SCI vary widely across countries, and depend on geographical location, opportunity, and expectation. Outcomes also vary due to discrepancies in the definition of employment, type of sample and the time of measurement (time since injury). A Swiss community-based observational study reported that 45.7% of people experiencing SCI returned to pre-injury employment, 32.9% changed employers, and 21.4% never

returned to work (paid employment) after SCI with an overall paid employment rate of 78.6% [7]. Whereas, the paid employment rate after SCI has been reported as 35% in the USA [8], 49.9% in Australia [9], and 82% in South India [10]. A cross-sectional survey in 22 countries across the world reported a 38% of paid employment rate after SCI with a wide variation across countries, ranging from 10.3% to 61.4% [11]. Sturm et. al. reported that out of 623 persons unemployed after SCI, 319 (51.2%) wished to work, among which 220 (35.3%) subjectively perceived they were able to work [12]. The mean duration of time to RTW after SCI was reported as 4.9 years [13]. RTW is positively associated with better quality of life as well as higher psychological, financial, and social wellbeing in people with SCI [14]. The benefits of employment after SCI go beyond financial compensation, as it provides a sense of identity, social connections, a reason to start a day, [15] and higher life expectancy [16].

The overall RTW rate after SCI is lower than the employment rate of the general population. Therefore, it is important to find better ways to support RTW because this is not only associated with improved finances, but also with improving physical, emotional, and psychosocial wellbeing after a SCI. Getting back to work and sustaining employment is undeniably challenging for a person with SCI because of the physical, emotional, and psychological body functions, activities and environmental factors required to be successful in any remunerative employment.

Previous systematic and scoping reviews have consolidated different barriers and facilitators related to RTW following SCI [17, 18, 19, 20]. However, the strength of the association of these barriers and facilitators with the RTW outcome has not been clearly defined. A systematic review categorized employment definition into three themes: a) salary dependent (i.e., working for pay, gainfully employed, competitive employment, or earning minimum wage), b) employed vs unemployed (i.e., volunteer, retired and homemaker were combined with the "employed" category in some studies while others have categorized students, homemakers and volunteers as "unemployed"), and c) hours-dependent work (e.g., working at least 12 hours per week) [22].

The diversity in definition of RTW after SCI in available literature makes it challenging to interpret rates of employment and factors associated with them. Bloom et. al. reported that most of the literature on RTW after SCI come from North America (59%), followed by Europe (22%), Asia (10%), Australia (10%), Africa (1%), with no reports from South America [22]. In addition

most of the literature in these regions come from High Income Countries (HIC), as defined by the "World Bank Country Classification by Income 2021-2022" [23]. The paucity of evidence on RTW following SCI in Low and Middle Income Countries (LMIC) makes it difficult to understand which factors are most likely to influence RTW in countries with low per capita income. Consequently, it is important to identify factors related to RTW after a SCI considering the socio-economic status of the counties where research was conducted. There is evidence supporting that higher individual socioeconomic status is positively associated with success in RTW in SCI; however, it is unknown whether this situation applies to LMIC [24].

Problem statement

There is a need to better understand the strength of association between body structures and functions, activities, and environmental factors with the outcome of RTW after SCI. In addition, considering how these factors could have a different impact depending on countries' socioeconomic status will help understand how the association between these factors and RTW varies between HIC and LMIC.

Purpose

This systematic review aimed to identify the significant factors associated with RTW for people with SCI, the strength of their association with RTW and their variation among HIC and LMIC. This will provide a direction for future research aimed at improving successful RTW following SCI in different countries and inform healthcare policy makers for potential improvements.

Objectives

- 1. To identify factors associated with RTW after SCI in the available literature.
- 2. To perform a meta-analysis to identify factors associated with RTW after SCI, estimating the strength of associations.
- 3. To explore how the identified factors associated with RTW after a SCI vary between HIC and LMIC.

Method

The Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines were followed to conduct and report this review [25]. The study was registered in the PROSPERO database (registration number CRD42022325836).

Eligibility criteria

Inclusion criteria:

- Articles that described the RTW process after SCI.
- Articles that discussed the factors associated with RTW after SCI.
- Articles that were published in the English language.
- Employment/RTW after SCI was a key concept of the study, not just a part of a questionnaire.
- Full-text articles.

Exclusion criteria:

- Descriptive data was not disaggregated as employed and unemployed.
- Outcomes of employed versus unemployed expressed only in inferential estimates (e.g., as odds ratios, rate ratios or risk ratios).
- SCI data was not disaggregated from other injuries. For instance, if the study compares RTW after SCI and multiple sclerosis, descriptive data for SCI and multiple sclerosis should be disaggregated as employed and unemployed separately.
- Policy reports, analysis, dissertations, editorials, opinion pieces, scoping and systematic reviews were excluded.

Search strategy

A comprehensive literature search of MEDLINE, Embase, CINAHL, PsycINFO and Scopus databases was conducted and included all the relevant articles from inception to April 26, 2022. To ensure all expectations of comprehensiveness were addressed, a health sciences research librarian at the University of Alberta was consulted to define the search strategy. Search terms

Injury. The full search strategy implemented is available as supplementary material (Appendix C). All retrieved articles were imported to COVIDENCE, a web-based software platform that streamlines the production of systematic reviews.

Study selection process

Two independent reviewers conducted the title and abstract screening, and full-text review. Inter-Rater Reliability (IRR) was estimated using Cohen's Kappa test for two raters i.e. Bina and Rija (once for the abstract screening and once for full text selection). Cohen's Kappa was 0.66 for the title and abstract screening stage, indicating substantial agreement, while it was 0.98 for the full text review stage, indicating almost perfect agreement [26]. All disagreements between the two reviewers were resolved by discussion with a third reviewer until a perfect agreement was achieved.

Data collection process

A standardized data extraction spreadsheet was developed by the author upon considering feedback from all review team members. Data extracted from included articles were: 1) first author name, year of publication and country of research conducted, 2) sample size, 3) research design, 4) data collection method, 5) definition of employment including total of participants employed and unemployed, and 6) factors studied. The author filled the spreadsheet after going through full-texts of the included articles. The second reviewer checked the correctness of data filled in the spreadsheet upon reading the full-texts of the included articles and left a comment wherever there was disagreement. Any discrepancies in data extraction were resolved first by consensus between the two reviewers and if required, through discussion with the third reviewer. For meta-analysis, separate spreadsheets were made for each factor, including: 1) study ID (serial number provided by COVIDENCE), 2) total employed and unemployed, 3) segregated data of the factor to be studied (for example: for a factor ethnicity; Employed-White, Employed-Others, Unemployed-White, and Unemployed-Others), and 4) the socio-economic status of the country where research was conducted. All these data were taken from the main data extraction spreadsheet.

Quality assessment

We assessed the quality of evidence behind each factor identified using a modification of the GRADE methodology [27, 28]. We only considered the assessment of "risk of bias" and "inconsistency" because the concepts of "indirectness" and "imprecision" could not be applied consistently due to variations in studies' methodological designs. As for publication bias we assumed this existed because we only used studies published in English language so this factor couldn't be utilized as a criterion to differentiate quality among the meta-analyses conducted.

Risk of bias was examined using the Newcastle-Ottawa Scale (NOS) and its extension for cross-sectional studies [29]. The NOS appraises studies in three different domains: Selection, Comparability, and Outcome. It contains 8 items within the 3 domains and the total maximum score is 9. A study with a score from 7-9 is considered low risk, 4-6 is high risk, and 0-3 is very high risk of bias.

To identify the overall risk of bias of a factor, we categorized it into three different groups: low risk, moderate risk, and high risk. For each of the factors, if all (100%) of the articles included had low risk of bias, it was considered as low risk, if 50% or more of the articles included had low risk of bias, it was considered as moderate risk, and if less than 50% of the articles included had low risk of bias, it was considered as high risk.

For inconsistency the criteria utilized was: if the test of heterogeneity (I²) was less than or equal to 30%, then no inconsistency was assumed, if I² was between 31% - 60%, we judged moderate inconsistency, I² between 61% - 75% was judged as substantial inconsistency, and if I² was between 76% - 100%, then inconsistency was judged as considerable. For overall quality of evidence for each factor, I² up to 60% was not penalized and I² between 61% - 100% was penalized; however, if the heterogeneity was explained by subgroup analysis (i.e. if I² dropped during subgroup analysis) it was considered as no inconsistency and was not penalized. For example: for a particular factor, if the risk of bias was low; however, the inconsistency was between 61% - 100% and the I² did not drop while doing subgroup analysis, then the overall quality of evidence was decreased to the level immediately below its initial level of quality (i.e., dropping down from high quality to moderate quality or from moderate quality to low quality).

Statistical analysis

Meta-analyses were conducted using statistical software (i.e., Stata BE 17). Only factors that were reported on three or more articles qualified for meta-analysis. A random-effects model was used. Nominal and continuous data were analyzed estimating log odd ratios and mean differences (Hedge's g), respectively. 95% CI and p values were estimated considering a p<.05 as statistically significant. The I² statistic was used to evaluate heterogeneity among the included articles.

RTW factors categorization

The identified factors associated with RTW were classified according to the ICF domains. Subgroup analysis of factors were done on the basis of economic status of the countries where research was conducted, when possible. Countries were categorized as HIC and LMIC according to the World Bank classification [23].

Results:

A total of 7,341 articles were identified from five different databases, 3,834 included after removing duplicates (refer to Figure 1). A full text review of 130 articles was done after abstract screening. After screening full texts, 52 studies were eligible and included in the systematic review (refer to Table 1). Of these, 47 were from HIC [7, 9, 12, 14, 15, 30-72], 4 from upper middle income countries [73-76], 1 from lower middle income countries[10], and none were from low income countries. Among the articles included, 33 were cross-sectional studies [9, 10, 12, 24, 30, 35, 36, 38, 40-42, 46, 48-50, 52, 54, 57, 59-64, 67-69, 72-75, 78], 18 were longitudinal studies [7, 31-34, 37, 39, 43-45, 51, 53, 55, 58, 65, 66, 70, 76] and 1 was a pilot study [59].

Nineteen factors qualified for the meta-analysis. Following is the description of results organized by the factors explored during the meta-analyses.

1. Functional Independence Measure (FIM)

Five studies (n=1,976) identified an association between FIM and RTW after SCI (refer Table SOF). Our meta-analysis showed a significant association, meaning that the average FIM score of people employed was higher than those unemployed (Hedges's g = 0.67) [refer to Figure 2.1] with

a medium quality of evidence, meaning further research could change the conclusion. No subgroup analysis was possible as there were no studies from LMIC.

2. Age at injury

Fifteen studies (n=3,673) identified an association between age at injury and RTW after SCI (refer to Table SOF). Our meta-analysis showed a significant association, meaning that on average, people employed after SCI were younger than those who were unemployed (Hedges's g = -0.30) [refer to Figure 2.2] with low quality of evidence, meaning further research could change the conclusion. No subgroup analysis was possible as there were no enough studies from LMIC.

3. Age at data collection

Twenty studies (n=7,683) identified an association between age at data collection and RTW after SCI (refer table SOF). Our meta-analysis showed a significant association, meaning that the average age of people employed were younger than those unemployed (Hedges's g = -0.24) [refer to Figure 2.3] with low quality of evidence, meaning further research could change the conclusion. No subgroup analysis was possible as there were no enough studies from LMIC.

4. Time since injury

Thirteen studies (n=4,437) identified an association between time since injury and RTW after SCI (refer to Table SOF). Our meta-analysis showed a significant association, meaning that the average time since injury of employed people was higher than people who were unemployed (Hedges's g = 0.31) [refer to Figure 2.4] with low quality of evidence, meaning further research could change the conclusion. No subgroup analysis was possible as there were no studies from LMIC.

5. Ability to live alone

Nine studies (n=3,120) identified an association between the ability to live alone and RTW after SCI (refer to Table 2a). Our meta-analysis showed a significant association, meaning that a person who is able to live alone has higher chances of being employed (OR= 2.59) [refer to Figure 2.5a] with a low quality of evidence, meaning further research could change this conclusion. A subgroup analysis by country's level of income showed this significant association held for HICs but not for

LMICs; however, the country category could not explain the high heterogeneity observed (refer Figure 2.5b).

6. Annual income

Three studies (n=1,491) identified an association between annual income and RTW after SCI (refer table SOF). Our meta-analysis showed a significant association, meaning that there are higher chances of being employed if a person's annual income is ≥\$20,000 compared to <\$20,000 (OR= 0.15) [refer to Figure 2.6] with low quality of evidence, meaning further research could change the conclusion. No subgroup analysis was possible as there were no studies from LMIC.

7. Ability to drive

Three studies (n=664) identified an association between ability to drive and RTW after SCI (refer table SOF). Our meta-analysis showed a significant association, meaning that a person who is able to drive has higher chances of being employed after a SCI (OR= 4.76) [refer to Figure 2.7] with low quality of evidence, meaning further research could change the conclusion. No subgroup analysis was possible as there were no enough studies from LMIC.

8. Employment at the time of injury

Three studies (n=386) identified an association between employment at the time of injury and RTW after SCI (refer table SOF). Our meta-analysis did not show a significant association [refer to Figure 2.8] with a low quality of evidence, meaning further research could change the observed results. No subgroup analysis was possible as there were no studies from LMIC.

9. Gender

Thirty-six studies (n=31,080) identified an association between gender and RTW after SCI (refer Table SOF). Our meta-analysis did not show a significant association (refer to Figure 2.9a) with low quality of evidence, meaning further research could change the results observed. A subgroup analysis by the country's income level did not show a significant association and could not explain the high heterogeneity observed (refer to Figure 2.9b).

10. Education level

Twenty studies (n=20,343) identified an association between education level and RTW after SCI (refer table SOF). Our meta-analysis showed a significant association, meaning that there are higher chances of being employed if a person had a degree of high school or more (OR= 0.45) [refer to Figure 2.10] with low quality of evidence, meaning further research could change the conclusion. No subgroup analysis was possible as there were no studies from LMIC.

11. Pre-injury employment

Ten studies (n=2,936) identified an association between being employed pre-injury (anytime) and RTW after SCI (refer Table SOF). Our meta-analysis did not show a significant association for this factor [refer to Figure 2.11] with low quality of evidence, meaning further research could change the observed results. No subgroup analysis was possible as there were no studies from LMIC.

12. Ethnicity

Nine studies (n=23,192) identified an association between ethnicity and RTW after SCI (refer table SOF). Our meta-analysis showed a significant association, meaning that there are higher chances of being employed if a person is white compared to other races (OR= 2.16) [refer to Figure 2.12] with low quality of evidence, meaning further research could change the conclusion. No subgroup analysis was possible as there were no studies from LMIC.

13. Level of injury

Twenty-seven studies (n=9,376) identified an association between level of injury and RTW after SCI (refer Table SOF). Our meta-analysis showed a significant association, meaning that a paraplegic person has higher chances of being employed compared to a tetraplegic person (OR = 0.73) [refer to Figure 2.13a] with a medium quality of evidence, meaning further research could change the conclusion. A subgroup analysis by the country's income level showed significant association for the HICs and not for the LMICs, also explaining the high heterogeneity observed (refer to Figure 2.13b).

14. Medical comorbidities

Four studies (n=22,491) identified an association between medical comorbidities and RTW after SCI (refer Table SOF). Our meta-analysis did not show a significant association [refer to Figure 2.14] with low quality of evidence, meaning further research could change the results observed. No subgroup analysis was possible as there were no studies from LMIC.

15. Pre-injury work intensity

Three studies (n=839) identified an association between pre-injury work intensity (low vs moderate/high) and RTW after SCI (refer table SOF). Our meta-analysis did not show a significant association [refer to Figure 2.15] with low quality of evidence, meaning further research could change the conclusion. No subgroup analysis was possible as there were no studies from LMIC.

16. Marital status

Twenty-three studies (n=20,367) identified an association between marital status (married vs others) and RTW after SCI (refer Table SOF). Our meta-analysis showed a significant association, meaning that a person who is married has higher chances of being employed (OR= 1.54) [refer to Figure 2.16a] with medium quality of evidence, meaning further research could change the conclusion. A subgroup analysis by the country's income level showed significant association for the HICs but not for the LMICs and explained the high heterogeneity observed (refer to Figure 2.16b).

17. Wheelchair use

Four studies (n=925) identified an association between wheelchair use and RTW after SCI (refer to Table SOF). Our meta-analysis showed a significant association, meaning that there are higher chances of being employed if a person does not use a wheelchair (OR= 0.44) [refer to Figure 2.17] with low quality of evidence, meaning further research could change the conclusion. No subgroup analysis was possible as there were no studies from LMIC.

18. Vocational training

Three studies (n=437) identified an association between vocational training and RTW after SCI (refer to Table SOF). Our meta-analysis did not show a significant association [refer to Figure 2.18] with high quality of evidence, meaning further research is unlikely to change this conclusion. No subgroup analysis was possible as there were no studies from LMIC.

19. Type of injury

Fourteen studies (n=3,919) identified an association between the type of injury (i.e., complete vs incomplete) and RTW after SCI (refer table SOF). Our meta-analysis did not show a significant association [refer to Figure 2.19a] with a medium quality of evidence, meaning further research could change the conclusion. A subgroup analysis by the country's income level did not show a significant association and did not explain the high heterogeneity observed (refer to Figure 2.19b).

Discussion:

This systematic review identified that personal, impairment and activity limitation factors are emphasized over environmental factors in available literature on RTW after SCI. There is a lack of high quality prospective studies, cross-sectional studies dominating the literature of this area. There is paucity of evidence on factors associated with RTW after SCI in LMIC. Nineteen factors qualified for meta-analysis and twelve factors: Being younger at the time of injury, Being younger at the time of data collection, More time since injury, Having higher FIM score, Being able to live alone, Being able to drive, \geq high school education, \geq \$20,000 annual income, Being White, Paraplegia, Being married, and being able to use a wheelchair were found significantly associated with RTW after SCI.

Mapping of identified factors according to the WHO ICF framework

All the components of the ICF model (i.e., body structure and function, activity, participation, personal, and environmental factors) were represented in the factors reported as associated with RTW after SCI in the literature (refer to Table 3.1); however, none of the environmental factors qualified to be included in the meta-analysis as they were not explored in three or more articles. In addition, the majority of factors included in the meta-analysis were personal factors (refer to Table

3.2). This suggests that the main focus of the research in this area is on personal, impairment and activity limitation factors, lacking scientific evidence on the effect of the environment on RTW after SCI. The increased focus on personal factors explored in the studies suggests that successful RTW after SCI is mainly attributed to the individual characteristics of a person and not so much on the employment environmental demands. Alternatively, our findings could reflect the fact that personal factors are easier to study, as it is easier to collect them from medical charts. In contrast, exploring environmental factors is more time, energy, and financially consuming as they require visiting working environment.

Considering that RTW is the result of the capacity of an individual, including personal factors and health conditions, to effectively address the environmental work demands, then our review demonstrates the literature mostly focuses only on one aspect of the RTW process. This is important to recognize as environmental factors are more susceptible to be modified than personal factors when considering interventions to increase the rate of RTW after SCI. Therefore, future research should equally prioritize environmental factors to understand and overcome low rates of RTW after SCI.

Vocational training was not a significant factor in the meta-analysis, and this is supported by high quality of evidence. This finding contradicts the existing literature, and this could be explained by the variety of the components that vocational rehabilitation programs can have. As vocational rehabilitation is a complex intervention with so many variations, our results suggest we need to understand better which are the components of vocational training that are more effective and how they interact with each other to promote a successful RTW after SCI.

Comparison of factors between HIC and LMIC

Out of fifty-two articles included in the study, only five articles were from LMIC and forty-seven articles were from HIC. This reveals a need to increase high quality scientific production from LMIC on RTW after SCI. All nineteen factors that qualified for meta-analysis were explored in HIC and six factors were not explored in LMIC (i.e., vocational training, pre-injury work intensity, time since injury, annual income, FIM and ethnicity). Occupations that demand the use of analytical and interpersonal skills, the skills that cannot be substituted away by technology/machinery (e.g., researchers, artists, managers, etc), are more common in HIC. This

suggests that occupations that involve more physical intensity (e.g., heavy machine operators, manufacturing and agricultural laborers, etc) are more common in LMIC [76]. Pre-injury work intensity has not been explored in LMIC, when it is of particular importance to know how work's physical demands are related to RTW after SCI in LMIC. Therefore, there is a dire need to explore pre-injury work intensity in LMIC.

Only five factors qualified for subgroup analysis because of the lesser number of articles being included from LMIC. In a subgroup analysis of five factors, three were significant (i.e., level of injury, ability to live alone, and being married) and two (i.e., type of injury and gender) were not significant overall. All the three factors that were significant overall, were significant in HIC; however, none were significant in LMIC. This result might have been influenced by a small sample size and lesser number of articles being included from LMIC compared to HIC.

Comparison of RTW rate between HIC and LMIC

Literature from India and Malaysia showed RTW rates after SCI as 82% and 76.2%, respectively [10,74]; whereas RTW rates after SCI were 49.9% in Australia, 26.5% in Finland, 29.8% in the USA, and 32% in Canada [9,57,72,77]. The RTW rate after SCI appears higher in LMIC as compared to HIC. This is likely because most LMIC do not provide disability benefits and if the patient is the primary income generator of the family, they are left with no option other than RTW in some capacity.

Factors associated with RTW after SCI

Being able to drive, Being able to live alone, Being White, Being paraplegic, Having \geq high school education, Having \geq \$20,000 annual income were the most important factors associated with RTW after a SCI.

Limitations

This review included literature only available in the English language. If any relevant articles were found in non-English language, we tried to locate its English version; however, this was not always successful. Thus, some of the factors could have been systematically excluded, especially from Asia, Africa and South America. Having the majority of included articles from HIC (i.e., North

America, Australia and Europe) could restrict the ecological validity of our findings to LMIC. The Inter-Rater Reliability (IRR) of abstract screening, which was estimated by Cohen's Kappa test for two raters, was 0.66, meaning substantial agreement; however, all disagreements between two reviewers were solved by discussion with a third reviewer until a perfect agreement was achieved. For quality assessment, we modified the GRADE methodology to account for variations in the methodological designs of the included studies. We only considered "risk of bias"- assessed using Newcastle-Ottawa Scale and "inconsistency" of the original GRADE approach. This approach has not been validated and could have limited our interpretations on the quality of the evidence assessed.

Future research

Cross sectional studies dominate the literature available to date on RTW after SCI, which makes it hard to understand the cause and effect relationship within this phenomenon. Therefore, high quality longitudinal studies should be conducted. The majority of studies exploring RTW after SCI were conducted in HIC, which impacts the generalizability of the findings considering geographical, economical, and cultural aspects. More research exploring factors associated with RTW after SCI in LMIC is warranted. Future research should focus on different types of work people with SCI are returning to. All of this will inform the decisions of rehabilitation professionals, who can help to guide the RTW process after SCI in a timely manner. Lastly, future research should focus on which components of vocational rehabilitation are more effective and how they interact with each other to optimize the rate of RTW after SCI.

Conclusion

All factors identified as significantly associated with RTW were explored in HIC. There is a paucity of evidence on factors associated with RTW in LMIC so more research is needed in this area. Personal, impairment and activity limitation factors appear to be emphasized over environmental factors in the available literature, and there is a lack of high quality prospective studies in this area.

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Appendix A: List of Figures

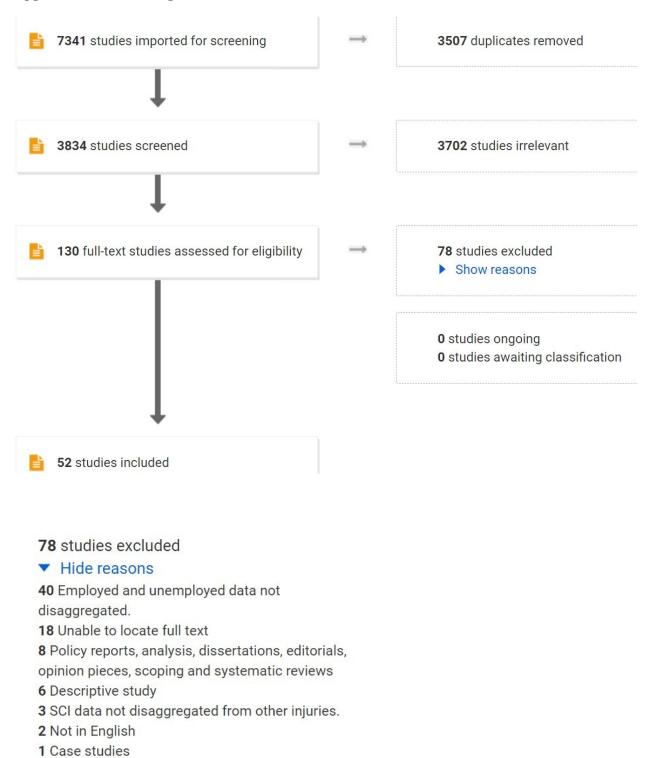
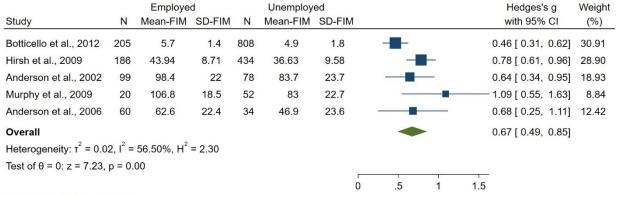


Figure 1. PRISMA diagram of the inclusion process



Random-effects REML model

Figure 2.1: Forest plot- FIM score

Study	N	Employed Mean-Age at injury	SD	N	Unemployed Mean-Age at injury	SD		Hedges's g with 95% CI	Weight (%)
Ferdiana et al., 2014	58	34.7	10.8	56	36.3	12.5	_	-0.14 [-0.50, 0.23]	6.88
Gunduz et al., 2010	33	25.2	10.4	119	33.88	15		-0.61 [-1.00, -0.22]	6.55
Hess et al., 2000	171	32.5	10.3	575	34.1	12.3	-	-0.13 [-0.31, 0.04]	9.56
Hirsh et al., 2009	186	31.49	12.95	434	35.1	14.76	-	-0.25 [-0.43, -0.08]	9.55
Trezzini et al., 2018	191	31.19	15.77	52	34	11.57		-0.19 [-0.49, 0.12]	7.70
Noreau et al., 1992	39	21	8.9	21	27.4	9.5		-0.69 [-1.23, -0.16]	4.84
Anderson et al., 2002	99	14	4.2	78	14.2	3.8		-0.05 [-0.34, 0.25]	7.85
Lin et al., 2009	72	35.7	11.8	147	41.7	15.4	_	-0.42 [-0.70, -0.13]	8.02
Ottomanelli et al., 2009	9	53	10.7	21	53.1	10		-0.01 [-0.77, 0.75]	3.13
Ottomanelli et al., 2011	82	28.3	9.9	156	37.8	12.2		-0.83 [-1.10, -0.55]	8.12
Schonherr et al., 2004	33	33.9	10.3	16	33.7	10.8		0.02 [-0.57, 0.61]	4.38
Anderson et al., 2006	60	15	3.1	34	14.4	3.6		0.18 [-0.24, 0.60]	6.19
Lidal et al., 2009	58	19	6.7	107	26	10.2	_	-0.76 [-1.09, -0.43]	7.38
Krause et al., 2010	485	24.83	9.94	281	26.25	10.88	-	-0.14 [-0.28, 0.01]	9.84
Overall							•	-0.30 [-0.46, -0.14]	
Heterogeneity: $\tau^2 = 0.06$	$I^2 = 7$	5.96%, H ² = 4.16							
Test of $\theta = 0$: $z = -3.64$, p	0.0 = 0.0	0							
							-1 0		

Random-effects REML model

Figure 2.2: Forest plot- Age at injury

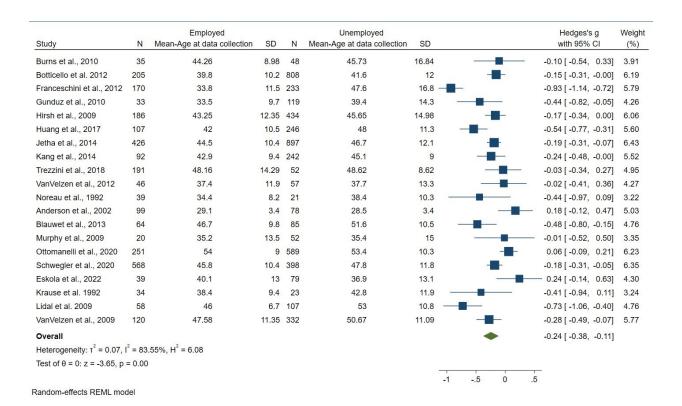


Figure 2.3: Forest plot- Age at data collection

Study	N	Employed Mean-Time since injury	SD	N	Unemployed Mean-Time since injury	SD		Hedges's g with 95% CI	Weight (%)
Hirsh et al., 2009	186	12.53	9.91	434	11.22	10.3		0.13 [-0.04, 0.30]	9.22
Huang et al., 2017	107	19.9	8.4	246	17	10.8		0.29 [0.06, 0.51]	8.68
Jetha et al., 2014	426	20.3	13	897	17	13.2		0.25 [0.14, 0.37]	9.64
Jang et al., 2005	80	12	6	89	8	6		0.66 [0.35, 0.97]	7.80
Noreau et al., 1992	39	13.4	8.8	21	11	8.1		0.28 [-0.25, 0.80]	5.49
Anderson et al., 2002	99	14.7	4	78	14.2	4.7		0.12 [-0.18, 0.41]	7.95
Blauwet et al., 2013	64	20.5	10.8	85	17.9	12		0.22 [-0.10, 0.55]	7.63
Lin et al., 2009	72	3.2	1.3	147	3.2	1.4		0.00 [-0.28, 0.28]	8.11
Ottomanelli et al., 2009	9	16.6	12	21	13.9	11.5 -		0.23 [-0.54, 0.99]	3.66
Ottomanelli et al., 2020	251	23.3	12.7	589	12.4	11.9	-	0.90 [0.74, 1.05]	9.37
Ottomanelli et al., 2011	82	19.7	11.8	156	11	9.9		- 0.82 [0.54, 1.10]	8.16
Anderson et al., 2006	60	14.3	4	34	14.7	5.1		-0.09 [-0.51, 0.33]	6.59
Lidal et al. 2009	58	27	4.4	107	27	4.2		0.00 [-0.32, 0.32]	7.70
Overall							-	0.31 [0.12, 0.49]	
Heterogeneity: $\tau^2 = 0.09$	I ² = 8	5.35% , $H^2 = 6.83$							
Test of $\theta = 0$: $z = 3.29$, p							5 0 .5 1	-	
Random-effects REML me	odel								

Figure 2.4: Forest plot- Time since injury

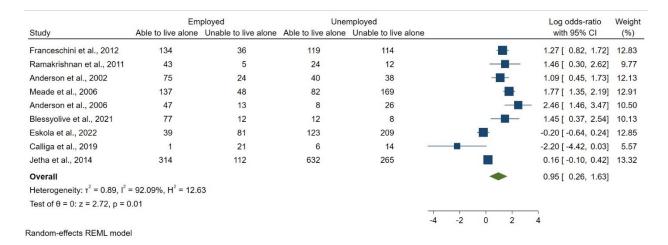


Figure 2.5a: Forest plot-Ability to live alone

	Em	ployed	Uner	mployed		Log odds-ratio	Weight
Study	Able to live alone	Unable to live alone	Able to live alone	Unable to live alone		with 95% CI	(%)
Low/Middle Income Countries							
Ramakrishnan et al., 2011	43	5	24	12	_	1.46 [0.30, 2.62]	9.77
Blessyolive et al., 2021	77	12	12	8	_	1.45 [0.37, 2.54]	10.13
Calliga et al., 2019	1	21	6	14		-2.20 [-4.42, 0.03]	5.57
Heterogeneity: $T^2 = 3.10$, $I^2 = 86$	$6.42\%, H^2 = 7.36$					0.43 [-1.75, 2.61]	
High Income Countries							
Franceschini et al., 2012	134	36	119	114	-	1.27 [0.82, 1.72]	12.83
Anderson et al., 2002	75	24	40	38	-	1.09 [0.45, 1.73]	12.13
Meade et al., 2006	137	48	82	169	-	1.77 [1.35, 2.19]	12.91
Anderson et al., 2006	47	13	8	26		2.46 [1.46, 3.47]	10.50
Eskola et al., 2022	39	81	123	209	-	-0.20 [-0.64, 0.24]	12.85
Jetha et al., 2014	314	112	632	265		0.16 [-0.10, 0.42]	13.32
Heterogeneity: $T^2 = 0.84$, $I^2 = 94$	4.14%, H ² = 17.08				•	1.04 [0.27, 1.81]	
Overall					•	0.95 [0.26, 1.63]	
Heterogeneity: $\tau^2 = 0.89$, $I^2 = 92$	2.09%, H ² = 12.63						
					-4 -2 0 2	4	
Random-effects REML model							

Figure 2.5b: Forest plot-Sub-group meta-analysis of ability to live alone

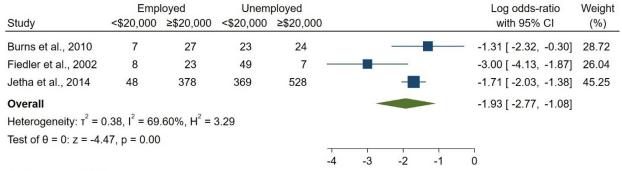


Figure 2.6: Forest plot- Annual income

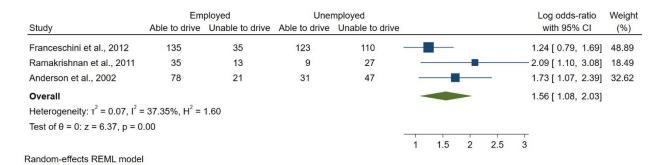


Figure 2.7: Forest plot- Ability to drive

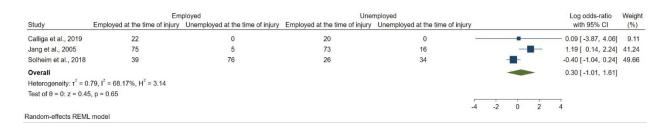


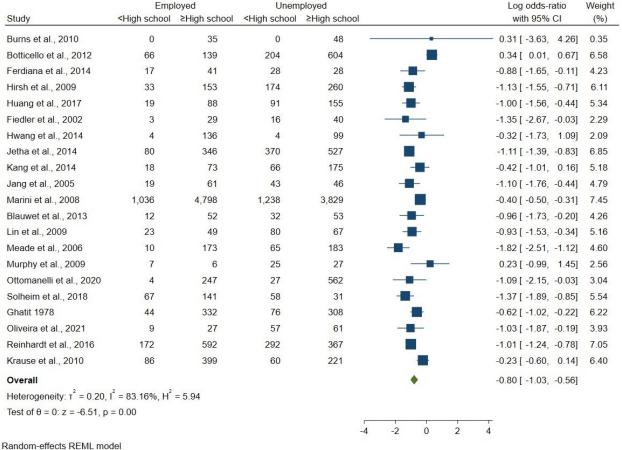
Figure 2.8: Forest plot-Employment at the time of injury

Study		ployed Female		nployed Female	Log odds-ratio with 95% CI	Weigh (%)
- 000 CONTROL - AND REVIOUS CONTROL	20000000	7-1-3	9276563	33,91614	10000 00000000000000000000000000000000	ans gates
Botticello et al., 2012	165	40	654	154	-0.03 [-0.42, 0.3	£4
Calliga et al., 2019	17	5	16	4	-0.16[-1.64, 1.3	
Ferdiana et al., 2014	46	12	41	15	0.34 [-0.53, 1.2	
Gunduz et al., 2010	19	14	100	19	-1.36 [-2.20, -0.5	
Hirsh et al., 2009	114	69	298	139	-0.26 [-0.62, 0.1	
Huang et al., 2017	82	25	197	49	-0.20 [-0.75, 0.3	4] 3.33
Fiedler et al., 2002	25	7	47	9	-0.38 [-1.48, 0.7	·
Hwang et al. 2014	87	53	80	23	-0.75 [-1.33, -0.1	8] 3.18
Jetha et al., 2014	299	127	580	317	0.25 [0.00, 0.5	0] 4.95
Kang et al., 2014	82	10	197	45	0.63 [-0.10, 1.3	6] 2.50
Ramakrishnan et al., 2011	42	6	28	8	— ■ — 0.69 [-0.47, 1.8	5] 1.36
Trezzini et al., 2018	148	43	36	16	0.43 [-0.25, 1.1	0] 2.71
Jang et al., 2005	70	10	77	12	0.09 [-0.81, 0.9	9] 1.95
Marini et al., 2008	3,748	2,086	3,371	1,696	-0.10 [-0.18, -0.0	2] 5.59
Anderson et al., 2002	64	35	62	16	-0.75 [-1.44, -0.0	6] 2.68
Blauwet et al., 2013	51	13	72	13	-0.34 [-1.19, 0.5	0] 2.10
Lin et al., 2009	62	10	116	31	0.50 [-0.27, 1.2	8] 2.34
Meade et al., 2006	141	44	182	67	- - 0.17 [-0.27, 0.6	0] 3.90
Murphy et al., 2009	18	2	40	12	0.99 [-0.60, 2.5	9] 0.81
Ottomanelli et al., 2009	9	0	20	1	0.33 [-2.96, 3.6	2] 0.21
Ottomanelli et al., 2020	236	15	565	24	-0.40 [-1.07, 0.2	6] 2.78
Ottomanelli et al., 2011	77	5	150	6	-0.48 [-1.70, 0.7	3] 1.26
Tomassen et al., 2000	40	23	60	78	0.82 [0.20, 1.4	3] 3.00
Schwegler et al., 2020	488	120	282	116	0.51 [0.22, 0.8	1] 4.71
Krause et al., 1999	825	718	2,155	2,262	0.19 [0.07, 0.3	0] 5.50
Franceschini et al., 2012	141	29	195	38	-0.05 [-0.58, 0.4	8] 3.41
VanVelzen et al., 2012	36	10	43	14	0.16 [-0.77, 1.0	8] 1.88
Anderson et al., 2006	38	22	29	5	-1.21 [-2.30, -0.1	3] 1.50
Borg et al., 2021	356	94	769	316	0.44 [0.18, 0.7	0] 4.88
Eskola et al., 2022	86	34	226	106	0.17 [-0.29, 0.6	
Lidal et al., 2009	49	9	86	21	0.28 [-0.57, 1.1	4] 2.08
Oliveira et al., 2021	33	3	91	27	1.18 [-0.07, 2.4	
Reinhardt et al., 2016	601	170	454	220	0.54 [0.30, 0.7	
VanVelzen et al., 2009	32	7	60	19	0.37 [-0.60, 1.3	
Krause et al., 2010	368	117	194	87	0.34[0.02, 0.6	
Overall					0.09 [-0.06, 0.2	
Heterogeneity: $\tau^2 = 0.11$, I^2	= 77.43	%, H ² = 4	.43			2577
Test of $\theta = 0$: $z = 1.20$, $p = 0$						

Figure 2.9a: Forest plot- Gender

Study	Mark Control	ployed Female		nployed Female					Log odds-ratio with 95% CI	Weigh (%)
Low/Middle Income Country										17
Calliga et al., 2019	17	5	16	4				2	-0.16 [-1.64, 1.32]	0.92
Gunduz et al., 2010	19	14	100	19					-1.36 [-2.20, -0.51]	
Ramakrishnan et al., 2011	42	6	28	8			_		0.69 [-0.47, 1.85]	
Oliveira et al., 2021	33	3	91	27			_		1.18 [-0.07, 2.44]	
Heterogeneity: $\tau^2 = 1.05$, $I^2 =$						4			0.04 [-1.13, 1.21]	
High Income Country										
Botticello et al., 2012	165	40	654	154					-0.03 [-0.42, 0.36]	4.19
Ferdiana et al., 2014	46	12	41	15			-		0.34 [-0.53, 1.21]	
Hirsh et al., 2009	114	69	298	139					-0.26 [-0.62, 0.10]	
Huang et al., 2017	82	25	197	49		3			-0.20 [-0.75, 0.34]	
Fiedler et al., 2002	25	7	47	9			_		-0.38 [-1.48, 0.72]	
Hwang et al. 2014	87	53	80	23		-			-0.75 [-1.33, -0.18]	
Jetha et al., 2014	299	127	580	317					0.25 [0.00, 0.50]	
Kang et al., 2014	82	10	197	45			-	_	0.63 [-0.10, 1.36]	
Trezzini et al., 2018	148	43	36	16					0.43 [-0.25, 1.10]	
Jang et al., 2005	70	10	77	12		0.2			0.09 [-0.81, 0.99]	
Marini et al., 2008	3,748	2,086	3,371	1,696					-0.10 [-0.18, -0.02]	
		35	62	1,090						
Anderson et al., 2002	64 51								-0.75 [-1.44, -0.06]	
Blauwet et al., 2013		13	72	13			_		-0.34 [-1.19, 0.50]	
Lin et al., 2009	62	10	116	31			-	-	0.50 [-0.27, 1.28]	
Meade et al., 2006	141	44	182	67					0.17 [-0.27, 0.60]	
Murphy et al., 2009	18	2	40	12		2			0.99 [-0.60, 2.59]	
Ottomanelli et al., 2009	9	0	20	1		000	_		- 0.33 [-2.96, 3.62]	
Ottomanelli et al., 2020	236	15	565	24					-0.40 [-1.07, 0.26]	
Ottomanelli et al., 2011	77	5	150	6		_			-0.48 [-1.70, 0.73]	
Tomassen et al., 2000	40	23	60	78				- 1	0.82 [0.20, 1.43]	
Schwegler et al., 2020	488	120	282	116					0.51 [0.22, 0.81]	4.71
Krause et al., 1999	825	718	2,155	2,262					0.19 [0.07, 0.30]	5.50
Franceschini et al., 2012	141	29	195	38		9			-0.05 [-0.58, 0.48]	3.41
VanVelzen et al., 2012	36	10	43	14					0.16 [-0.77, 1.08]	
Anderson et al., 2006	38	22	29	5	22	-	_		-1.21 [-2.30, -0.13]	1.50
Borg et al., 2021	356	94	769	316					0.44 [0.18, 0.70]	4.88
Eskola et al., 2022	86	34	226	106			-		0.17 [-0.29, 0.63]	3.79
Lidal et al., 2009	49	9	86	21		8	-	ii.	0.28 [-0.57, 1.14]	2.08
Reinhardt et al., 2016	601	170	454	220					0.54 [0.30, 0.77]	5.02
VanVelzen et al., 2009	32	7	60	19		9	-	-	0.37 [-0.60, 1.34]	1.77
Krause et al., 2010	368	117	194	87					0.34 [0.02, 0.67]	4.53
Heterogeneity: τ ² = 0.08, I ² =	73.809	6 , $H^{2} = 3$.	82						0.11 [-0.03, 0.26]	
Overall							•		0.09 [-0.06, 0.25]	
Heterogeneity: $\tau^2 = 0.11$, $I^2 =$	77.439	6, H ² = 4.	43	3		1		-	-	
Random-effects REML model				-	4 -	2	0	2	4	

Figure 2.9b: Forest plot-Sub-group meta-analysis of gender



Random-enects Reine model

Figure 2.10: Forest plot- Education level

	Em	ployed	Uner	nployed		Log odds-ratio	Weight
Study	Employed pre-injury	Unemployed pre-injury	Employed pre-injury	Unemployed pre-injury	У	with 95% CI	(%)
Botticello et al., 2012	132	73	511	297	-	0.05 [-0.27, 0.37]	13.43
DeVivo et al., 1982	46	1	38	9		— 2.39 [0.28, 4.50]	6.67
Franceschini et al., 2012	166	4	170	63	_	2.73 [1.70, 3.77]	10.97
Huang et al., 2017	77	30	209	37		-0.79 [-1.34, -0.24]	12.84
Kang et al., 2014	73	17	196	40		-0.13 [-0.76, 0.50]	12.58
Ramakrishnan et al., 2011	35	13	28	8	_	-0.26 [-1.27, 0.75]	11.06
Jang et al., 2005	75	5	72	17		1.26 [0.22, 2.31]	10.90
Meade et al., 2006	154	27	193	48	-	0.35 [-0.17, 0.87]	12.94
Murphy et al., 2009	18	2	38	14		1.20 [-0.39, 2.78]	8.61
Overall					-	0.61 [-0.15, 1.36]	
Heterogeneity: $\tau^2 = 1.09$, $I^2 =$	= 89.99%, H ² = 9.99						
Test of $\theta = 0$: $z = 1.56$, $p = 0$.12						
					-2 0 2		
Random-effects REML model							

Figure 2.11: Forest plot- Employment pre-injury

	En	nployed	Une	employed				Log odds-ratio	Weight
Study	White	Non-white	White	Non-white				with 95% CI	(%)
DeVivo et al., 1982	36	11	23	24	-	_		1.23 [0.34, 2.11]	8.34
Blauwet et al., 2013	58	6	71	14	-	-		0.65 [-0.37, 1.66]	7.06
Lasprilla et al., 2010	1,134	188	5,974	2,941				1.09 [0.93, 1.25]	18.32
Meade et al., 2006	151	34	157	94	-			0.98 [0.53, 1.43]	14.30
Ottomanelli et al., 2009	8	1	13	8				1.59 [-0.66, 3.85]	2.03
Ottomanelli et al., 2011	45	37	75	81	-			0.27 [-0.26, 0.81]	12.95
Anderson et al., 2006	59	1	28	6		-		2.54 [0.37, 4.70]	2.19
Boticello et al., 2012	155	50	461	347	-			0.85 [0.50, 1.20]	15.92
Marini et al., 2008	4,090	1,744	3,391	1,676				0.15 [0.07, 0.23]	18.89
Overall					•			0.77 [0.43, 1.11]	
Heterogeneity: $\tau^2 = 0.16$,	$I^2 = 87.5$	$52\%, H^2 = 8.$	01						
Test of $\theta = 0$: $z = 4.45$, p	= 0.00								
					0	2	4	6	

Figure 2.12: Forest plot- Ethnicity

Study	Empl Tetraplegia	oyed Paraplegia	Unem Tetraplegia	ployed Paraplegia	ŭ.	Log odds-ratio with 95% CI	Weight (%)
Burns et al., 2010	16	18	13	34	_	0.84 [-0.08, 1.77]	2.05
Ferdiana et al., 2014	20	38	27	29	_	-0.57 [-1.32, 0.18]	2.77
Franceschini et al., 2012	53	117	95	138	-	-0.42 [-0.84, -0.00]	5.21
Gunduz et al., 2010	5	27	24	96		-0.30 [-1.35, 0.75]	1.68
Huang et al., 2017	48	59	144	102	-	-0.55 [-1.01, -0.09]	4.83
Jetha et al., 2014	172	254	399	498		-0.17 [-0.40, 0.07]	7.10
Kang et al., 2014	58	31	145	93	-	0.18 [-0.33, 0.69]	4.39
Krause et al., 1992	79	57	93	55	-	-0.20 [-0.68, 0.28]	4.66
Krause et al., 1996	45	132	42	115	-	-0.07 [-0.56, 0.42]	4.54
Ramakrishnan et al., 2011	9	39	10	26		-0.51 [-1.54, 0.52]	1.75
Trezzini et al., 2018	52	138	19	33		-0.42 [-1.07, 0.22]	3.36
VanVelzen et al., 2012	11	29	22	32		-0.59 [-1.48, 0.29]	2.22
Jang et al., 2005	18	62	33	56	_	-0.71 [-1.39, -0.03]	3.18
Anderson et al., 2002	51	48	53	25		-0.69 [-1.31, -0.07]	3.56
Meade et al., 2006	84	65	108	92	-	0.10 [-0.33, 0.52]	5.12
Murphy et al., 2009	8	12	34	18		-1.04 [-2.10, 0.02]	1.66
Ottomanelli et al., 2009	3	6	12	9		-0.98 [-2.61, 0.65]	0.79
Ottomanelli et al., 2020	147	104	399	190	•	-0.40 [-0.70, -0.09]	6.36
Ottomanelli et al., 2011	58	24	80	76	-	0.83 [0.26, 1.40]	3.89
Schonherr et al., 2004	12	21	6	10		-0.05 [-1.28, 1.19]	1.29
Solheim et al., 2018	64	144	40	49	-	-0.61 [-1.12, -0.10]	4.36
Tomassen et al., 2000	63	83	137	117	-	-0.43 [-0.84, -0.02]	5.28
Schwegler et al., 2020	153	415	162	236	•	-0.62 [-0.89, -0.35]	6.70
Anderson et al., 2006	33	27	28	6		-1.34 [-2.36, -0.32]	1.78
Oliveira et al., 2021	11	25	44	74		-0.30 [-1.10, 0.50]	2.54
Reinhardt et al., 2016	204	563	244	424		-0.46 [-0.69, -0.24]	7.20
VanVelzen et al., 2009	9	28	9	42		0.41 [-0.63, 1.45]	1.72
Overall Heterogeneity: $\tau^2 = 0.07$, $I^2 = 0.07$	= 54.04%, H ² =	2.18			•	-0.31 [-0.47, -0.16]	
Test of $\theta = 0$: $z = -4.04$, $p = 0$	0.00						
					-4 -2 0	2	
Random-effects REML model							

Figure 2.13a: Forest plot- Level of injury

Study		loyed Paraplegia		ployed Paraplegia	ì			Log odds-i with 95%		Weight (%)
Lower/Middle Income Countrie									0.702	()
Gunduz et al., 2010	5	27	24	96		_		-0.30 [-1.35,	0.75]	1.68
Ramakrishnan et al., 2011	9	39	10	26		-		-0.51 [-1.54,	0.52]	1.75
Oliveira et al., 2021	11	25	44	74				-0.30 [-1.10,	0.50]	2.54
Heterogeneity: $\tau^2 = 0.00$, $I^2 = 0$.00%, H ² = 1.00						-	-0.36 [-0.90,	0.18]	
High Income Countries										
Burns et al., 2010	16	18	13	34			-	— 0.84 [-0.08,	1.77]	2.05
Ferdiana et al., 2014	20	38	27	29		-	-	-0.57 [-1.32,	0.18]	2.77
Franceschini et al., 2012	53	117	95	138			-	-0.42 [-0.84,	-0.00]	5.21
Huang et al., 2017	48	59	144	102			-	-0.55 [-1.01,	-0.09]	4.83
Jetha et al., 2014	172	254	399	498				-0.17 [-0.40,	0.07]	7.10
Kang et al., 2014	58	31	145	93			-	0.18 [-0.33,	0.69]	4.39
Krause et al., 1992	79	57	93	55			-	-0.20 [-0.68,	0.28]	4.66
Krause et al., 1996	45	132	42	115			-	-0.07 [-0.56,	0.42]	4.54
Trezzini et al., 2018	52	138	19	33				-0.42 [-1.07,	0.22]	3.36
VanVelzen et al., 2012	11	29	22	32		_	-	-0.59 [-1.48,	0.29]	2.22
Jang et al., 2005	18	62	33	56		Ç-	-	-0.71 [-1.39,	-0.03]	3.18
Anderson et al., 2002	51	48	53	25		_	-	-0.69 [-1.31,	-0.07]	3.56
Meade et al., 2006	84	65	108	92			-	0.10 [-0.33,	0.52]	5.12
Murphy et al., 2009	8	12	34	18		-	_	-1.04 [-2.10,	0.02]	1.66
Ottomanelli et al., 2009	3	6	12	9		X 	_	-0.98 [-2.61,	0.65]	0.79
Ottomanelli et al., 2020	147	104	399	190				-0.40 [-0.70,	-0.09]	6.36
Ottomanelli et al., 2011	58	24	80	76			-	- 0.83 [0.26,	1.40]	3.89
Schonherr et al., 2004	12	21	6	10		9.0	-	-0.05 [-1.28,	1.19]	1.29
Solheim et al., 2018	64	144	40	49		57	-	-0.61 [-1.12,	-0.10]	4.36
Tomassen et al., 2000	63	83	137	117			-	-0.43 [-0.84,	-0.02]	5.28
Schwegler et al., 2020	153	415	162	236				-0.62 [-0.89,	-0.35]	6.70
Anderson et al., 2006	33	27	28	6		-		-1.34 [-2.36,	-0.32]	1.78
Reinhardt et al., 2016	204	563	244	424				-0.46 [-0.69,	-0.24]	7.20
VanVelzen et al., 2009	9	28	9	42			_	- 0.41 [-0.63,	1.45]	1.72
Heterogeneity: $\tau^2 = 0.08$, $I^2 = 6$	0.32% , $H^2 = 2.5$	2					•	-0.31 [-0.48,	-0.15]	
Overall							•	-0.31 [-0.47,	-0.16]	
Heterogeneity: $\tau^2 = 0.07$, $I^2 = 5$	4.04% , $H^2 = 2.1$	8						2500 83	67	
					-4	-2	Ó	2		
Random-effects REML model					4	-2	U	_		

Figure 2.13b: Forest plot-Sub-group meta-analysis of level of injury

	Empl	oyed	Unem	ployed		Log odds-ratio	Weight
Study	Comorbidities-Present	Comorbidities-Absent	Comorbidities-Present	Comorbidities-Absen	t	with 95% CI	(%)
Ramakrishnan et al., 2011	11	37	7	29		— 0.21 [-0.86, 1.27]	17.24
Jang et al., 2005	71	9	80	9		-0.12 [-1.10, 0.86]	18.76
Marini et al., 2008	595	11,073	679	9,455		-0.29 [-0.40, -0.18]	35.21
Meade et al., 2006	129	56	223	28	_	-1.24 [-1.74, -0.74]	28.79
Overall						-0.45 [-1.06, 0.17]	
Heterogeneity: $\tau^2 = 0.28$, $I^2 =$	79.80%, H ² = 4.95						
Test of $\theta = 0$: $z = -1.42$, $p = 0$).16						
					-2 -1 0 1		
Random-effects REML model							

Figure 2.14: Forest plot- Medical co-morbidities

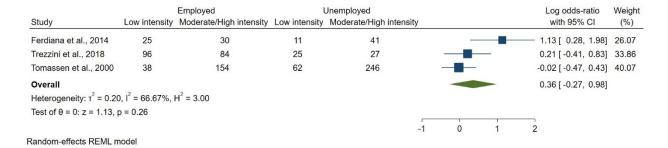


Figure 2.15: Forest plot- Pre-injury work intensity

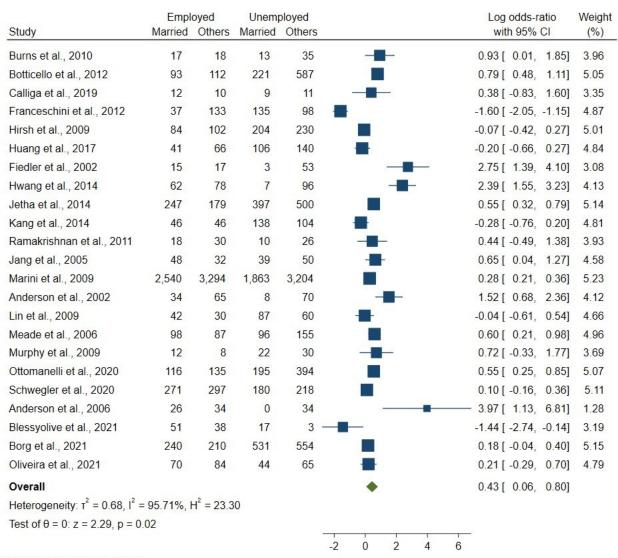


Figure 2.16a: Forest plot- Marital status

	Empl	oyed	Unemp	ployed	Log odds-ratio	Weigh
Study	Married	Others	Married	Others	with 95% CI	(%)
Lower/Middle Income countries						
Calliga et al., 2019	12	10	9	11	0.38 [-0.83, 1.60]	3.35
Ramakrishnan et al., 2011	18	30	10	26	0.44 [-0.49, 1.38]	3.93
Blessyolive et al., 2021	51	38	17	3	-1.44 [-2.74, -0.14]	3.19
Oliveira et al., 2021	70	84	44	65	0.21 [-0.29, 0.70]	4.79
Heterogeneity: $\tau^2 = 0.25$, $I^2 = 53.5$	56%, H ² =	2.15			• 0.01 [-0.67, 0.69]	
High Income Countries						
Burns et al., 2010	17	18	13	35	0.93 [0.01, 1.85]	3.96
Botticello et al., 2012	93	112	221	587	0.79 [0.48, 1.11]	5.05
Franceschini et al., 2012	37	133	135	98	-1.60 [-2.05, -1.15]	4.87
Hirsh et al., 2009	84	102	204	230	-0.07 [-0.42, 0.27]	5.01
Huang et al., 2017	41	66	106	140	-0.20 [-0.66, 0.27]	4.84
Fiedler et al., 2002	15	17	3	53	2.75 [1.39, 4.10]	3.08
Hwang et al., 2014	62	78	7	96	2.39 [1.55, 3.23]	4.13
Jetha et al., 2014	247	179	397	500	0.55 [0.32, 0.79]	5.14
Kang et al., 2014	46	46	138	104	-0.28 [-0.76, 0.20]	4.81
Jang et al., 2005	48	32	39	50	0.65 [0.04, 1.27]	4.58
Marini et al., 2009	2,540	3,294	1,863	3,204	0.28 [0.21, 0.36]	5.23
Anderson et al., 2002	34	65	8	70	1.52 [0.68, 2.36]	4.12
Lin et al., 2009	42	30	87	60	-0.04 [-0.61, 0.54]	4.66
Meade et al., 2006	98	87	96	155	0.60 [0.21, 0.98]	4.96
Murphy et al., 2009	12	8	22	30	0.72 [-0.33, 1.77]	3.69
Ottomanelli et al., 2020	116	135	195	394	0.55 [0.25, 0.85]	5.07
Schwegler et al., 2020	271	297	180	218	0.10 [-0.16, 0.36]	5.11
Anderson et al., 2006	26	34	0	34	3.97 [1.13, 6.81]	1.28
Borg et al., 2021	240	210	531	554	0.18 [-0.04, 0.40]	5.15
Heterogeneity: $\tau^2 = 0.76$, $I^2 = 96.6$	66%, H ² =	29.93			• 0.53 [0.11, 0.95]	
Overall					◆ 0.43 [0.06, 0.80]	
Heterogeneity: $\tau^2 = 0.68$, $I^2 = 95.7$	71%, H ² =	23.30				
					-2 0 2 4 6	
Random-effects REML model						

Figure 2.16b: Forest plot-Sub-group meta-analysis of marital status

		Employed	L	Jnemployed		Log odds-ratio	Weight
Study	Use wheelchair	Unable to use wheelchair	Use wheelchair	Unable to use wheelchair	6-	with 95% CI	(%)
Blauwet et al., 2013	49	15	59	26	_	0.36 [-0.38, 1.10]	23.89
Lin et al., 2009	13	59	71	76		-1.44 [-2.13, -0.76]	24.69
Meade et al., 2006	83	89	158	73	_	-0.84 [-1.25, -0.43]	28.13
Oliveira et al., 2021	17	19	91	27		-1.33 [-2.11, -0.54]	23.29
Overall Heterogeneity: $\tau^2 = 0$.	E2 1 ² = 92 200/ L	u² – 6.02				-0.82 [-1.59, -0.04]	
		1 - 0.02					
Test of $\theta = 0$: $z = -2.0$	6, p = 0.04						
					-2 -1 0	1	
Random-effects REML	. model						

Figure 2.17: Forest plot- Wheelchair use

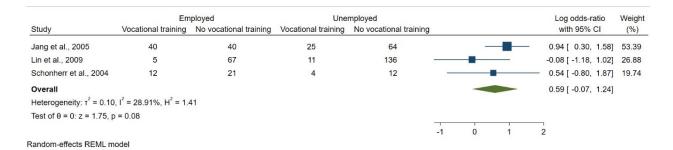


Figure 2.18: Forest plot-Vocational training

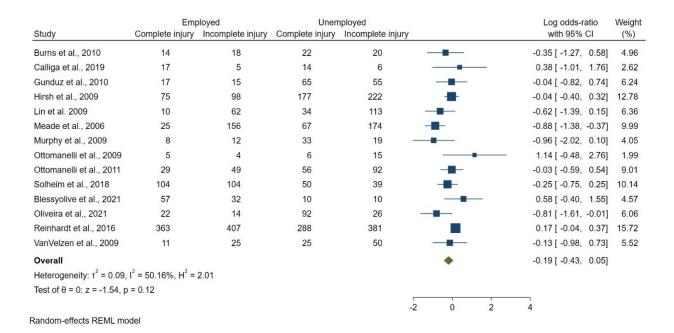


Figure 2.19a: Forest plot- Type of injury

	Control of the Contro	oloyed		nployed		Log odds-ratio	Weight
Study	Complete injury	Incomplete injury	Complete injury	Incomplete injury	1	with 95% CI	(%)
Low/Middle Income Country							
Calliga et al., 2019	17	5	14	6		0.38 [-1.01, 1.70	3] 2.62
Gunduz et al., 2010	17	15	65	55		-0.04 [-0.82, 0.74	1] 6.24
Blessyolive et al., 2021	57	32	10	10	_	0.58 [-0.40, 1.58	5] 4.57
Oliveira et al., 2021	22	14	92	26	-	-0.81 [-1.61, -0.0	6.06
Heterogeneity: $\tau^2 = 0.19$, $I^2 = 4$	$45.77\%, H^2 = 1.84$				-	-0.06 [-0.70, 0.59)]
High Income Country							
Burns et al., 2010	14	18	22	20		-0.35 [-1.27, 0.58	3] 4.96
Hirsh et al., 2009	75	98	177	222	-	-0.04 [-0.40, 0.33	2] 12.78
Lin et al. 2009	10	62	34	113	_	-0.62 [-1.39, 0.1	6.36
Meade et al., 2006	25	156	67	174	-	-0.88 [-1.38, -0.3	7] 9.99
Murphy et al., 2009	8	12	33	19	_	-0.96 [-2.02, 0.10	0] 4.05
Ottomanelli et al., 2009	5	4	6	15		1.14 [-0.48, 2.70	3] 1.99
Ottomanelli et al., 2011	29	49	56	92		-0.03 [-0.59, 0.54	9.01
Solheim et al., 2018	104	104	50	39	-	-0.25 [-0.75, 0.29	5] 10.14
Reinhardt et al., 2016	363	407	288	381		0.17 [-0.04, 0.3	7] 15.72
VanVelzen et al., 2009	11	25	25	50		-0.13 [-0.98, 0.73	3] 5.52
Heterogeneity: $\tau^2 = 0.09$, $I^2 = \xi$	56.56% , $H^2 = 2.30$				•	-0.22 [-0.49, 0.00	3]
Overall					•	-0.19 [-0.43, 0.09	5]
Heterogeneity: $\tau^2 = 0.09$, $I^2 = \xi$	50.16% , $H^2 = 2.01$						
					-2 0 2	4	
Random-effects REML model							

Figure 2.19b: Forest plot-Sub-group meta-analysis of type of injury

Appendix B: List of Tables

Table 1: List of included articles

Article	Country	Definition of	Objectives	Factors	Conclusion
	of	employment		explored	
	research				
Burns et.al., 2010 [30]	USA (HIC)	Working full or part-time	"To explore the relationship between employment status and community access, perceived community discrimination , social support from significant others, depressive symptoms, and gender related variables for 83 men living with spinal cord injury."	Age at the time of data collection, Age at injury, Time since injury, Ethnicity, Being married, Sexual orientation, Education, Annual income, Means of injury, Type of injury, Level of injury, Extent of disability.	"Psychosocial variables such as community access, perceived discrimination, social support from significant others, depressive symptoms, and gender identity represent important and understudied predictors of employment status among men living with spinal cord injury."

Botticello	USA	Paid	"This study	Gender, Age	"Variation in
et.al, 2012	(HIC)	employment	investigates	at the time	area economic
[24]			the role of area	of data	conditions may
			economic	collection,	affect the
			characteristics	Age at	feasibility of
			in predicting	injury, Time	employment for
			employment a	since injury,	persons who
			key aspect of	Ethnicity,	experience
			social	Being	chronic physical
			participation	married,	disability during
			for adults with	Employed	adulthood, thus
			physical	pre-injury,	limiting full
			disabilities	Education,	participation in
			using data	FIM score,	society."
			from a	Self-rated	
			national	poor health,	
			registry of	Re-	
			persons with	hospitalized	
			spinal cord	in past year,	
			injury (SCI)."	Area level	
				characteristi	
				c.	
Calliga et. al.,	Brazil	Participant	"То	Gender,	"The study
2019 [73]	(LMIC)	returned to	investigate the	Being	reveals the need
		work	factors that	married,	to improve the
			affect the	Living	return to work
			return to work	alone,	process, in
			of individuals	Having	particular
			with traumatic	children,	regarding the
			paraplegia and	Employmen	qualification of

			to characterize	t at the time	adults with
			post-injury	of injury,	spinal cord
			work."	Education,	injury and the
				Current	adaptation of
				income,	transportation
				Economic	and working
				class, Means	spaces and
				of injury,	conditions so
				Type of	that such
				injury,	individuals can
				Industrial	effectively
				accident,	return to work
				Current	and sustain their
				work	activities with
				capacity,	quality."
				BDI,	
				WHOQOL-	
				Brief.	
D. III	TIGA	G : C 11	(/7)		(// 1
DeVivo et.	USA	Gainfully	"To examine	Age at	"The vocational
al., 1982 [31]	(HIC)	employed	the influence	injury,	rehabilitation
		(working in	of medical,	Ethnicity,	potential of
		competitive	demographic,	Employed	individual SCI
		labour market,	and	pre-injury.	patients is
		self-	epidemiologic		measureable
		employed,	variables on		using a
		participating	the spinal cord		relatively small
		in on-the-job	injury		number of
		training	patient's		sensitive
		program,	return to		predictor
		participating	gainful		variable."

		in sheltered	employment 3		
		workshop	years post-		
		activities, a	injury."		
		homemaker,			
		or a student) 3			
		years post-			
		injury.			
Ferdiana et.	Netherland	Paid work of≥	"To examine	Gender, Age	"Rehabilitation
al., 2014 [32]	(HIC)	1hour/week at	the	at injury,	interventions
		5 years post-	employment	Pre-injury	should enhance
		discharge.	situation and	occupation	the skills and
			predictors of	level,	qualifications of
			return to work	Physical	individuals with
			for individuals	intensity	physically-
			with spinal	pre-injury	demanding pre-
			cord injury 5	work, RTW	injury work in
			years after	support,	order to
			discharge from	Education,	improve access
			inpatient	Monthly	to suitable jobs
			rehabilitation.	income,	after spinal cord
			"	Means of	injury.
				injury, Type	Interventions
				of injury,	should focus not
				Level of	only on return to
				injury, FIM	work, but also
				score, Self-	on the quality of
				efficacy.	employment,
					including
					opportunities to

					pursue full-time work."
Franceschini	Italy (HIC)	Formally	"To assess the	Gender, Age	"Employment
et.al., 2012		involved in	occurrence	at the time	after SCI was
[33]		any regular	and predictors	of data	rather frequent
		job, either	of return to	collection,	and was related
		self-employed	work after	Being	to several
		or employed	traumatic	married,	patient
		in any public	spinal cord	Employed	characteristics
		or private	injury."	pre-injury,	and social
		organization,		Education,	factors. Specific
		and involved		Welfare	interventions on
		in any formal		subsidy,	the patient and
		study course.		Type of	on the social
				injury,	environment
				Level of	may favor
				injury,	employment
				Bladder	after SCI and
				continence,	improve quality
				Bowel	of life."
				continence,	
				Independent	
				in mobility,	
				Ability to	
				drive,	
				Participatio	
				n in	
				community,	
				Ability to	
				live alone,	

				Architectura l barriers, Re- hospitalizati on in past years, medical problem in last 6 months.	
Gunduz et. al., 2010 [74]	Turkey (LMIC)	Working for salaries.	"To determine the rate of employment and to establish the factors affecting vocational status in spinal cord injured patients living in Turkey."	of data collection, Age at injury, Time since injury, Education before and after injury,	"The employment rates after spinal cord injury are low in Turkey. There is a need to maximize the employment capacity. Social and educational activities after injury should be encouraged during rehabilitation."

Hess et. al.,	USA	Legally and	"To examine	Age at	"The ability to
2000 [34]	(HIC)	gainfully	the ability of	injury,	predict return to
		working in the	the Motor	Education,	work after SCI
		competitive	Index Score	Motor Index	was shown
		labour market.	(MIS), in	Score.	utilizing MIS
			combination		and
			with		demographic
			demographic		variables, with
			variables, to		nearly 80%
			predict return		accuracy. This
			to work during		suggests that
			a 3-year period		return to work
			for individuals		after SCI is a
			with spinal		dynamic
			cord injury		process, with
			(SCI)."		the level of
					importance of
					each variable
					changing with
					time post-
					injury."
TT:14 .1	TICA	W1-1 C-11	%T	C 1 A	"C1
Hirsh et. al.,	USA	Working full-	"To examine	Gender, Age	
2009 [35]	(HIC)	time or part-	the	at the time	
		time	associations	of data	
			between	collection,	better
			chronological	Age at	understand age-
			age, duration	injury, Time	related effects
			of SCI, and	since injury,	on employment
			age at SCI		status, which
			onset variables	Being	could be used to

			and	married,	help maximize
			employment	Education,	the quality of
			status in	Means of	life in
			individuals	injury, Type	individuals with
			with SCI	of injury,	SCI."
			through a	Physical	
			series of	functioning,	
			regression	Psychologic	
			analyses."	al	
				functioning,	
				Sleep,	
				Fatigue,	
				Pain	
				severity.	
Huang et. al.,	Taiwan	Paid work	"To examine	Gender, Age	"Vocational
2017 [36]	(HIC)	either full-	the	at the time	rehabilitation
		time or part-	employment	of data	services can use
		time	status and	collection,	the results to
			determinants	Time since	target efforts
			of	injury,	toward those at
			employability	Being	risk of
			for individuals	married,	unemployment.
			with spinal	Employed	"
			cord injury in	pre-injury,	
			Taiwan."	Education,	
				Means of	
				injury,	
				Extent of	
				disability,	
				Depressive	

				symptoms,	
				Functional	
				limitation,	
				Core self-	
				evaluation,	
				Perceived	
				social	
				support.	
Ferdiana et.	Netherland	Paid work of≥	"To identify	Gender, Age	"Distinct
al., 2014 [37]	(HIC)	12hour/week.	different	at injury,	employment
			employment	Employed	trajectories after
			trajectories in	pre-injury,	SCI were
			individuals	Education,	identified. More
			with spinal	Type of	than half of the
			cord injury	injury,	individuals with
			(SCI) after	Level of	SCI had a low
			discharge from	injury, FIM	employment
			initial	score, Self-	trajectory, and
			rehabilitation	efficacy.	only one-fifth of
			and to		the individuals
			determine		with SCI had a
			predictors of		steady
			different		employment
			trajectories		trajectory.
			from		Secondary
			demographic,		education and
			injury,		higher
			functional, and		functional
			psychological		independence
					level predicted

			characteristics.		steady
			,,		employment."
Fiedler et. al.,	USA	Pay for profit.	"To assess the	Gender,	"The fact that
2002 [38]	(HIC)	l ay isi pisiw	factors	Ethnicity,	financial
	(1110)		influencing	Being	disincentives
			employment	married,	and
			for individuals	Education,	transportation
			with spinal	Annual	barriers, as well
			cord injury."	income.	as helpful
					factors, are
					perceived so
					differently by
					individuals with
					SCI, depending
					on their
					employment
					status, should
					mandate
					additional
					research in this
					area."
Hwang et. al.,	USA	Paid work	"To determine	Gender, Age	"Employment
2014 [39]	(HIC)	including full-	in adults with	at the time	status remained
		time or part-	pediatric-onset	of data	relatively stable
		time,	spinal cord	collection,	in adults with
		including self-	injury (SCI)	Being	pediatric-onset
		employment.	employment	married,	SCI; however,
			outcomes,	Education,	changes in
			longitudinal		employment
			changes in		were associated

			employment	Type of	with education,
			over time and	injury.	secondary
			changes in		health
			psychosocial		conditions and
			outcomes		psychosocial
			associated		well-being."
			with		
			employment		
			status."		
Jetha et. al.,	Canada	Paid	"To compare	Gender, Age	"A life course
2014 [40]	(HIC)	employment	employment	at the time	perspective is
			participation	of data	important to
			of	collection,	understanding
			young/middle-	Time since	similarities and
			aged and older	injury,	differences
			adults with	Being	between
			SCI and to	married,	young/middle-
			examine the	Living with	aged and older
			association	another	adults with SCI
			between	person,	in their
			employment	Education,	employment
			and	Annual	participation.
			demographic	income,	Tailored
			and health	Social role	programs and
			factors, SCI-	participation	policies should
			related needs,	, Means of	be designed to
			and social role	injury, Type	promote labor
			participation at	of injury,	force
			the 2 life	Level of	involvement at
			phases."	injury, Self-	different phases

				reported	of the working
				health, SCI	life course."
				related	
				unmet	
				needs, SF-	
				12 (physical	
				and mental	
				score).	
Vana at al	South	Paid work > 1	"To	Candan Aga	"Indiana"
Kang et. al.,				Gender, Age	"Injury
2014 [41]	Korea	hour/week or	investigate	at the time	characteristics
	(HIC)	unpaid family	employment	of data	are the most
		work for > 18	status after	collection,	important
		hours/week	spinal cord	Age at	predictors of
			injury (SCI)	injury, Time	employment in
			and identify	since injury,	persons with
			personal,	Being	SCI. For
			family, and	married,	persons with
			injury	Employed	lower
			characteristics	pre-injury,	employment
			those affect	Education,	rate,
			their	Monthly	individualized
			employment in	income,	vocational
			South Korea."	Extent of	rehabilitation
				disability,	and
				Industrial	employment-
				accident.	support systems
					are required."
Krause et. al.,	USA	Paid	"To identify	Gender, Age	"There is
2020 [42]	(HIC)	employment	demographic,	at injury,	importance of
			educational,	Time since	policies

			and injury-	injury,	maximizing
			related	Ethnicity,	employment
			characteristics	Being	opportunities
			associated	married,	for people with
			with odds of	Education,	SCI to promote
			employment	Type of	the optimal
			and estimates	injury.	outcomes."
			of differential		
			earnings		
			among		
			participants		
			with spinal		
			cord injury."		
Krause et. al.,	USA	Not defined	"To compare	Age at the	"The study
1992 [43]	(HIC)		preinjury and	time of data	
			post-injury	collection,	reaffirmed the
			employment	Age at	need for
			rates in a	injury, Time	comprehensive
			diverse sample	since injury,	rehabilitation,
			of persons	Education,	identified the
			with spinal	Level of	need for
			cord injuries."	injury.	retraining
					several years
					after injury, and
					pointed to the
					role of higher
					education in
					producing high
					employment
					rates."

SA	Self-	"To	Age at the	"Results point
HIC)	employment	investigate the	time of data	to the need for
	or work for	relation	collection,	rehabilitation
	pay	between	Age at	professionals to
		selected	injury,	make special
		participant	Ethnicity,	efforts to
		characteristics	Education,	maximize
		and	Extent of	employability
		employment	disability.	after SC1
		outcomes after		among people
		spinal cord		with biographic
		injury."		characteristics
				that place them
				at greatest risk
				for
				unemployment.
				"
(alaysia	Self-	"To determine	Gender Age	"Functional
•			_	independence,
	1 ,			especially
	•			ability to drive,
				was strongly
		•		associated with
		_		return to work
		and to		and should be
		investigate the	Being	one of the
		impact of	married,	priority goals of
		various	Employed	comprehensive
		demographic,	pre-injury,	rehabilitation of
		injury-related	Education,	persons with
16		alaysia Self-	employment or work for pay between selected participant characteristics and employment outcomes after spinal cord injury." Self- MIC) employment and paid employment outcomes of persons with spinal cord injury (SCI) and to investigate the impact of various demographic,	employment or work for pay between Age at selected injury, participant characteristics and employment outcomes after spinal cord injury." alaysia Self- "To determine and paid employment outcomes of collection, persons with Age at spinal cord injury (SCI) and to investigate the impact of various employed demographic, pre-injury, Employed demographic, pre-injury, Employed demographic, pre-injury, investigate the impact of married, tasks at spinal cord injury, Time injury (SCI) semployed demographic, pre-injury, Employed demographic, pre-injury, Employed demographic, pre-injury, investigate the impact of pre-injury, Employed demographic, pre-injury, investigate the impact of pre-injury, investigate the injury investigate the impact of pre-injury, investigate the injury investigate the inj

			and work-	Financial	SCI. The
			related	incentives,	negative impact
			variables on	Level of	of recent
			these	injury,	hospitalization
			outcomes."	Medical co-	as well as
				morbidities,	financial
				Independent	compensation
				in mobility,	needs to be
				Ability to	probed further."
				drive,	
				Ability to	
				live alone,	
				Re-	
				hospitalized	
				in past	
				years.	
Trezzini et.	Switzerlan	Paid work	"To	Gender, Age	"Although the
	d (HIC)	(any	investigate	at the time	two pathways
an., 2010 [7]	u (IIIC)	remunerative	work and	of data	seem equally
		employment,	wellbeing-	collection,	viable,
		including self-	C	Age at	longitudinal
		employed	consequences	injury, Time	data are
		work and	of different	since injury,	required to
		work as an	return-to-work	Physical	corroborate the
		apprentice	(RTW)	intensity of	present
		and in	pathways after	pre-injury	findings, and
		sheltered	SCI."	job,	future research
		workshops.)		Education,	needs to clarify
				Means of	the role of the
				injury,	client triage

				Level of	system and of
				injury,	vocational
				Extent of	rehabilitation
				disability,	practices with
				Quality of	regard to
				life, Life	person-job
				satisfaction.	match and its
					impact on job
					satisfaction and
					job
					performance."
X7 X7 1	NI (1 1 1	D 1 1 C	"T 1 1	C 1 A	"D 4 1
VanVelzen	Netherland	Paid work of			
et. al., 2012	(HIC)	atleast 1 hour	the proportion		
[45]		or more per	of people with	of data	wheelchair
		week.	spinal cord	collection,	capacity at
			injury who	Education,	discharge. It is
			returned to	Type of	recommended
			work 5 years	injury,	to train
			after discharge	Level of	wheelchair
			from inpatient	injury.	capacity during
			rehabilitation,		rehabilitation in
			and to		the context of
			investigate		return to work,
			whether return		since the
			to work is		association with
			related to		return to work is
			wheelchair		another benefit
			capacity at		of the training of
			discharge from		wheelchair
			inpatient		capacity in

			rehabilitation.		addition to the
			,,		improvement of
					mobility and
					functional
					independency."
				- 1	
Jang et. al.,	Taiwan	Full-time,	"To study the		"Functional
2005 [46]	(HIC)	part-time,	employment	at the time	independence
		student,	rate and		was a strong
		homemaker	determinants	collection,	factor predicting
			of return to		return to work.
			work for	injury, Time	Rehabilitation
			persons with	since injury,	focused on
			traumatic	Being	education,
			spinal cord	married,	vocational
			injury (SCI) in	Employed	training, self-
			Taiwan."	pre-injury,	care ability,
				Employed at	community
				the time of	mobility, and
				injury,	environmental
				Vocational	modifications
				training,	could improve
				Education,	employability
				Extent of	after SCI."
				disability,	
				Medical co-	
				morbidities,	
				Independent	
				transport,	
				Barthel	
				Index.	

Marini et. al.,	USA	Employed in	"To examine	Gender,	"The results
2008 [47]	(HIC)	integrated	the effect of	Ethnicity,	confirmed
		competitive	demographic,	Being	substantial
		employment	work	married,	counseling,
		setting.	disincentives,	Education,	assistive
			and service	Work	technology, and
			variables on	disincentive	job placement
			employment	s, Co-	and support
			outcomes of	occuring	services are
			persons with	disability as	important to the
			spinal cord	Alcohol and	return-to-work
			injury in state	other drug	success of
			vocational	abuse, Co-	persons with
			rehabilitation	occuring	SCI."
			agencies."	disability as	
				Psychiatric	
				disability.	
Noreau et. al.,	Canada	Gainful	"To examine	Age at the	"The results
1992 [48]	(HIC)	employment	whether there	time of data	verified the
			is any	collection,	positive
			associations	Age at	relationship
			between the	injury, Time	between
			levels of	since injury,	physical fitness
			aerobic and	Education,	(body
			muscular	Body mass,	composition,
			fitness and the	BMI, Body	aerobic power,
			employment	fat, Peak	muscular
			status	power	endurance) and
			following	output.	the gainful
			SCI."		employment of

					paraplegics, but failed to show any significant relationship between physical fitness and the acceptance of physically demanding work by such
					individuals."
Anderson et.	USA	Employed ≥ 1	"To determine		_
al., 2002 [49]	(HIC)	hour/week	employment	at the time	the general
			outcomes of		population, the
			adults with	collection,	high rate of
			pediatric-onset	Age at	unemployment
			spinal cord	injury, Time	among adults
			injury (SCI)	since injury,	with pediatric-
			and factors	Ethnicity,	onset SCI is a
			associated	Being	cause for
			with those	married,	concern. Risk
			outcomes."	Education,	factors
				Annual	associated with
				income,	adult
				Means of	unemployment
				injury, Type	provide
				of injury,	guidelines for
				Level of	targeting
				injury,	rehabilitation

				Independent	resources and
				driving,	strategies."
				Independent	
				living,	
				Physical	
				functioning,	
				SF-12	
				(physical	
				and mental	
				score),	
				CHART	
				score,	
				SWLS	
				score.	
Blauwet et.	USA	Full or part	"To determine	Candan Aga	"In the adults
	(HIC)	Full or part time job, or	the association	Gender, Age at the time	with chronic
al., 2013 [50]	(IIIC)	regularly	between	of data	spinal cord
		volunteering	participation	collection,	injury,
		volunteering	in organized	Time since	participation in
			sports	injury,	organized sports
			programs and	Ethnicity,	was positively
			employment in	Education,	associated with
			adults with	Extent of	employment.
			chronic spinal	disability,	Further studies
			cord injury."	Wheelchair	are necessary to
				use,	determine the
				Participatio	causative nature
				n in	of this
				organized	association and
				sports,	how various

				Exercise	factors related
				time	to sports
				textiles,	participation
				BMI.	may
					contribute."
			_		
Sturm et. al.,	Germany	Gainful	"1) To	Education	"Education and
2020 [12]	(HIC)	employment	describe the		pain belong to
			prevalence of		the most critical
			labour market		factors and
			participation		thereby possible
			in the German		approaches to
			study		increase the
			population and		level of
			2) To analyse		employment,
			determinants		which is
			of labour		essential and
			market		highly relevant
			participation		not only for
			across relevant		earning money
			subpopulation		but also for self-
			s based on		confidence and
			demographic		social
			data, social		integration. SCI
			and health		has many
			related factors,		dimensions in
			and SCI		itself; support
			characteristics.		also should be
			"		multidimension
					al. Study results
					might help to

					improve
					participation."
Lasprilla et.	USA	Competitive	"To compare	Ethnicity	"Regardless of
al., 2010 [51]	(HIC)	employment	the odds of		race, short- and
			competitive		long-term
			employment		employment
			versus not		outcomes were
			competitive		not favorable
			employment		for persons with
			among a group		SCI; however,
			of white,		African
			African		Americans and
			American, and		Hispanics fared
			Hispanic		worse in
			persons with		employment
			spinal cord		outcomes
			injury (SCI) at		compared with
			1, 5, and 10		whites.
			years after		Rehabilitation
			injury."		professionals
					should work to
					improve
					employment
					outcomes for all
					individuals with
					SCI, with
					special
					emphasis on
					addressing
					specific needs

					of African
					Americans and
					Hispanics."
Krause et. al.,	USA	Gainful	"To describe		"Interventions
1999 [52]	(HIC)	employment	the	at the time	to improve
			relationship of	of data	employability
			multiple	collection,	should focus on
			biographic,	Age at	education and
			injury-related,	injury, Time	the needs of
			and	since injury,	individuals from
			educational	Ethnicity,	minority
			factors with	Employed	backgrounds."
			employment	pre-injury,	
			outcomes after	Education,	
			spinal cord	Type of	
			injury."	injury.	
Lin et. al.,	Taiwan	Washing in a	"To examine	Candan Asa	"T
,		Working in a		Gender, Age	"In addition to
2009 [53]	(HIC)	competitive	comprehensiv	at injury,	education level
		labor market,	ely the effects	Time since	and traditional
		self-	of physical,	injury,	physical factors,
		employed,	psychologic,	Being	overall injury
		homemaker,	and sociologic	married,	severity and
		or a student.	characteristics	Vocational	psychologic
			on	training,	factors such as
			employment	Education,	thrill and
			among persons	Type of	adventure
			after a	injury,	seeking and
			traumatic	Bladder	depression can
			spinal cord	incontinenc	also influence
				e, Use of	the return to

			injury (SCI) in	assistive	work after an
			Taiwan."	devices for	SCI."
				ambulation,	
				Wheelchair	
				use, Strong	
				social	
				support,	
				Barthel	
				Index Score.	
M 1 4 1	I IC A	W 1 ' C 11	"T 1 '1	C 1 A	"G 1
Meade et. al.,	USA	Working full	"To describe		"Secondary
2006 [54]	(HIC)	or part time	the	at the time	conditions may
			relationship	of data	influence the
			between work	collection,	level/intensity
			intensity,	Time since	of employment
			personal and	injury,	for individuals
			injury-related	Ethnicity,	with SCI and
			factors and the	Being	that working
			resources	married,	part-time still
			typically	Having	provides
			associated	children,	advantages over
			with	Employed	unemployment.
			employment,	pre-injury,	"
			including	Education,	
			insurance,	Compensati	
			access to	on status,	
			health care,	Type of	
			and salary."	injury,	
				Level of	
				injury,	
				Extent of	

				disability,	
				Medical co-	
				morbidities,	
				Uncontrolle	
				d spasticity	
				within past	
				12 months,	
				UTI within	
				past 12	
				months,	
				Chronic	
				pain within	
				past 12	
				months,	
				Unable to	
				access	
				medical care	
				within past	
				12 months,	
				Need of help	
				in daily	
				activities,	
				Wheelchair	
				use,	
				Perceived	
				health.	
Murphy et.	Australia	Paid	"To identify	Gender, Age	"To assist in
al., 2009 [55]	(HIC)	employment	the extent to	at the time	raising
			which early	of data	employment
			participation	collection,	achievements

			and	Being	post-injury,
			environmental	married,	attention should
			variables,	Employed	be given during
			when assessed	pre-injury,	rehabilitation to
			at discharge	Employed at	factors beyond
			from hospital,	the time of	the traditional
			add to injury	injury,	patient injury
			and	Education,	and
			demographic	Compensati	demographic
			variables in	on status,	variables, as
			the prediction	Type of	well as
			of	injury,	considering
			employment	Level of	community
			following	injury,	integration
			traumatic	Community	support services
			spinal cord	Integration	when
			injury."	Measure,	developing
				FIM,	vocational
				Discharge	rehabilitation
				area,	service plans."
				CHART	
				score.	
Ottomanelli	USA	Competitive	"To	Gender, Age	"The findings of
et. al., 2009	(HIC)	employment	investigate the	at injury,	this study
[56]			extent to	Time since	emphasize the
			which veterans	injury,	need to educate
			are able to	Ethnicity,	veterans,
			obtain	Type of	especially those
			competitive	injury,	with more
			employment	Level of	severe injuries,

			after a spinal	injury,	about vocational
			cord injury	Extent of	rehabilitation
			and to explore	injury.	services as a
			veterans' use		possible means
			of existing		of improving
			vocational		employment
			rehabilitation		outcomes in this
			services."		special
					population."
Ottomanelli	USA	Paid	"To examine	Gender, Age	"The baseline
et. al., 2020	(HIC)	employment	variables	at the time	
[57]	,	1 7	predictive of		rate following
			post-SCI	collection,	SCI of a large,
			return to	Time since	representative
			employment	injury,	sample, was
			and current	Ethnicity,	29.8%. Greater
			employment	Being	duration of SCI
			among a large	married,	predicted
			cohort of	Education,	unemployment,
			veterans with	Means of	likely due to the
			Spinal Cord	injury, Type	older age of this
			Injury (SCI)	of injury,	population.
			treated within	Level of	Additional years
			the Veterans	injury,	of education
			Health	Extent of	promoted
			Administratio	disability.	current and
			n (VHA) SCI		post-SCI
			System of		employment,
			Care."		while a history
					of legal

					problems was a
					barrier to
					employment."
Ottomanelli	USA	Competitive	"То	Gender, Age	"Vocational
et. al., 2011	(HIC)	employment	investigate	at injury,	rehabilitation
[58]			predictors of	Time since	interventions
			competitive	injury,	that focus on
			employment	Ethnicity,	rapid re-entry to
			after a spinal	Education,	the workforce
			cord injury	Type of	using existing
			(SCI) among	injury,	skill sets may
			veterans."	Level of	maximize post-
				injury,	SCI
				Extent of	employment."
				disability.	
Schonherr et.	Netherland	Reintegration	"To explore	Age at	"Positive
al., 2004 [59]	(HIC)	in paid work	the process of	injury,	expectations
			reintegration	Vocational	regarding
			in paid work	training,	resumption of
			following a	Education,	work after a SCI
			traumatic	Extent of	are an important
			spinal cord	disability,	indicator of
			injury (SCI),	Job	successful
			including the	expectation.	reintegration in
			role of early		work. An active
			expectations		role of the
			of individual		rehabilitation
			patients		team is
			regarding		recommended
			return to work,		in drawing up a

			indicators of		vocational
			success of job		reintegration
			reintegration		plan to prepare
			and a		the patient, the
			description of		employer and
			reintegration		professionals
			interventions		involved in the
			and barriers."		reintegration
					process."
G 11 1	27		(C)	G 1	
Solheim et.	Norway	Continue the	"To address:	Gender, Age	"Job motivation
al., 2018 [60]	(HIC)	same job as of	1) What	at the time	and work ability
		before injury	predicts	of data	could have
			employment	collection,	affected past
			among persons	Age at	employment,
			with spinal	injury,	and both the
			cord injury	Employed at	employed and
			(SCI) in	the time of	non-employed
			Norway? 2)	injury,	supported the
			How do the	Education,	statement that
			employed	Type of	employers
			compare with	injury,	discriminate
			the non-	Level of	against
			employed in	injury.	wheelchair
			their job		users."
			motivation,		
			labour		
			discrimination		
			, quality of		
			life, everyday		
			coping, health		

			and pain suffering?"		
			suffering:		
Tomassen et.	Netherland	Gainful	"To describe	Gender, Age	"Only a
al., 2000 [61]	(HIC)	employment	predictors of	at the time	minority
			return to work	of data	returned to
			after spinal	collection,	gainful
			cord injury	Time since	employment
			(SCI), in	injury,	after SCI even
			particular the	Physical	to a physically
			physical	intensity	less demanding
			intensity of the	pre-injury	job. In addition
			pre-injury	job, Extent	to intensive
			job."	of disability,	inpatient re-
				Barthel	education, long-
				Index Score.	term support in
					job seeking is
					very important,
					including
					switching to a
					less demanding
					job."
Schwegler	Switzerlan	Paid work	"To identify	Gender, Age	"Beyond
et.al., 2020	d (HIC)		associations	at the time	previously
[62]			between	of data	established
			selected	collection,	sociodemograp
			factors related	Being	hic and injury-
			to the social	married,	related risk
			background,	Education,	factors such as
			health,		female gender,
			functional		low education,

			independence,	Extent of	and high lesion
			and the	disability.	severity,
			environment		functional
			of persons		independence,
			with spinal		chronic pain,
			cord injury		and nationality
			(SCI) and their		proved crucial
			labor market		for labor market
			participation."		participation.
					These factors
					should receive
					particular
					attention in
					medical and
					vocational
					strategies
					striving for a
					sustainable
					work integration
					of persons with
					SCI."
Anderson et.	USA	Working full	"To assess the	Gender, Age	"Many
al., 2006 [63]	(HIC)	or part time	stability of		individuals with
an, 2000 [03]	(IIIC)	or part time	independent	of data	pediatric-onset
			living,	collection,	SCI achieve
			employment,	Age at	successful,
			and life	injury, Time	stable adult
			satisfaction	since injury,	outcomes. The
			and to	Ethnicity,	factors
			determine	Being	associated with

factors	married,	that success can
associated	Independent	help us improve
with stable,	living,	rehabilitation
successful	Education,	for future
outcomes."	Type of	
	injury,	1
	Level of	
	injury,	
	Uncontrolle	
	d spasticity	
	within past	
	12 months,	
	UTI within	
	past 12	
	months,	
	Chronic	
	pain within	
	past 12	
	months, Co-	
	occuring	
	disability as	
	drug abuse,	
	Bowel	
	incontinenc	
	e, Life	
	satisfaction,	
	FIM, Re-	
	hospitalized	
	in past year,	
	SF-12,	

				CHART	
				score.	
Blessyolive	India	Being	"To find the	Being	"Motivation and
et. al., 2021	(LMIC)	employed or	factors	married,	social support
[10]		self-	influencing the	Vocational	are critical to
		employed,	return to work	training,	successful
		either full-	status (RTW)	Type of	return to work
		time or part-	in persons	injury,	following SCI.
		time	with spinal	Ability to	Comprehensive
		(excluding	cord injury	live alone,	multidisciplinar
		students and	(SCI)."	Self-	y rehabilitation,
		homemakers)		motivation,	which targets
				Family	vocational
				support,	goals,
				Social	improvements
				support.	in individual
					functioning and
					mobility, and
					community
					access are
					important for
					successful
					employment
					outcomes."
D 1	A	D '1 1	(CF)	G 1	(AXA 11 - 4
Borg et. al.,		Paid work	"To	Gender,	"While there are
2021 [9]	(HIC)		contextualise	Being	current services
			post-injury	married,	and .
			employment	Means of	programmes in
			for people	injury.	place in
			with spinal		Australia that

			cord injury		support post-
			(SCI) in		injury
			Australia,		employment,
			including		findings
			work		indicate a need
			participation		for more
			rates, time to		comprehensive
			resuming		early
			work,		intervention
			underemploy		focused services
			ment and pre-		targeted towards
			and post-SCI		employers and
			employment		individuals."
			changes."		
C1 +'+ + 1	IIC A	D 44	"T	D .	44T, C 1
Ghatit et. al.,	USA	Part-time or	"To	Being	"It was found
1978 [64]	(HIC)	full-time	distinguish	married,	that respondents
			between	Education.	regarded private
			merely		employers as
			obtaining		being more
			employment		helpful than
			and whether		public agencies
			the individual		in both
			had sustained		obtaining and
			employment		sustaining
			as reflected by		employment."
			his current		
			status."		
Eskola et. al.,	Finland	worked for at	"To explore	Gender, Age	"The first
2022 [72]	(HIC)	least 1 h to	work	at the time	national survey
		earn a salary	participation	of data	among people

		or	and the health-	collection,	with spinal cord
		entrepreneuria	related factors	Living	injury in
		1 income	affecting work	alone,	Finland shows
		during the	participation	Having	low level of
		survey week	among the	children,	employment.
			Finnish Spinal	Means of	The results
			Cord injury	injury.	suggest that
			(FinSCI) study		pain, physical
			population."		function, and
					ability to
					participate in
					social roles
					should be
					monitored by
					health and
					vocational
					professionals
					when assessing
					a person's
					likelihood of
					being in work."
Goetz et. al.,	USA	Competitive	"To determine	Spasticity	"Further
2018 [65]	(HIC)	employment	the	and UTI	investigation is
2010 [03]	(IIIC)	employment	relationship	and OTT	needed to
			between		clarify whether
			medical and		comorbidity
			mental health		severity or
			comorbidities		combinations of
					specific
			in a large cohort of		comorbidities
			Colloit 01		comordidities

			veterans with		predict
			spinal cord		rehabilitation
			injury."		outcome,
					including
					employment."
Krause et. al.,	USA	Not defined	"To	Age at the	"Either current
1992 [66]	(HIC)		investigate the	time of data	employment or
			relationship	collection,	productivity
			between work	Age at	status is of
			history,	injury, Time	central
			biographical	since injury.	importance to
			status, and		adjustment."
			adjustment		
			after SCI."		
7111		7 11 1		~ 1	
Lidal et. al.,	Norway	Paid work	"The primary	_	"The study
2009 [67]	(HIC)		objective was		indicates a low
			to study	of data	employment-
			factors	collection,	rate in persons
			influencing	Age at	with SCI, even
			post-injury	injury, Time	several years
			employment	since injury,	after injury.
			and	Means of	From the
			withdrawal	injury,	results, we
			from work in	Chronic	suggest more
			persons who	pain.	support,
			sustained		especially to
			traumatic		persons of older
			spinal cord		age at injury
			injury (SCI)		and/or with a
			more than 20		history of pre-

			Troops ago A		injury medical
			years ago. A		
			secondary		condition(s), to
			objective was		help them to
			to study life		obtain work and
			satisfaction in		sustain
			the same		employed for
			patients."		more years after
					injury."
Oliveira et.	Brazil	Paid work	"To	Gender,	"Working-age
al., 2021 [76]	(LMIC)		investigate	Being	people with SCI
			paid work	married,	who underwent
			status and	Education	rehabilitation in
			return to work	before and	Brazil had a low
			(RTW)	after injury,	rate of paid
			pathways after	Means of	work. Fewer
			spinal cord	injury, Type	complications at
			injury."	of injury,	the time of the
				Level of	injury, returning
				injury,	to study, good
				Ability to	ability to work
				drive,	and greater
				Powered/ma	satisfaction with
				nual	the work status
				wheelchair.	increased the
					likelihood of
					being engaged
					in paid work."
D .:1 16 7	C!4 1	E1	(/T - 1 '1	C 1	"I MD
Reinhardt et.	Switzerlan	Employment	"To describe	Gender,	"LMP of
al., 2016 [68]	d (HIC)	or self-	labor market	Education,	persons with
		employment	participation	Means of	SCI is

		at the time of	(LMP) of	injury, Type	comparatively
		the survey for	persons with	of injury,	high in
		at least one	spinal cord	Level of	Switzerland.
		hour/week,	injury (SCI) in	injury.	LMP after SCI
		included	Switzerland,		is, however,
		competitive,	to examine		considerably
		sheltered and	potential		lower than in the
		supported	determinants		general
		employment	of LMP, and to		population.
			compare LMP		Future research
			between SCI		needs to show
			and the general		whether the
			population."		reduced LMP in
					SCI reflects
					individual
					capacity
					adjustment,
					contextual
					constraints on
					higher LMP or
					both."
Schonherr et.	Netherland	Work	"To give	Age at the	"Despite a high
al., 2005 [69]	(HIC)	gainfully for	insight into the	time of data	participation in
an, 2003 [07]	(IIIC)	at least 4	vocational	collection.	paid work
		hours a week.	situation	concetion.	following SCI,
		nours a week.	several years		the effort of the
			after a		disabled worker
			traumatic		to have and keep
			spinal cord		a job should not
			injury (SCI)		be
			3 3 (-)		

			and describe		underestimated.
			the personal		"
			experiences		
			and unmet		
			needs; to give		
			an overview of		
			health and		
			functional		
			status per type		
			of SCI and		
			their		
			relationship		
			with		
			employment		
			status."		
VanVelzen	Netherland	Worked at	"To describe	Gender, Age	"RTW was
et. al., 2009	(HIC)	least 1 hr/wk			
[70]	(IIIC)	in paid	people with	of data	33% of the
[, 4]		employment	spinal cord	collection,	subjects.
		1 3	injury who	Type of	
			returned to	injury,	capacity was
			work (RTW) 1	Level of	-
			year after	injury.	related to RTW.
			discharge from		Therefore, it is
			inpatient		recommended
			rehabilitation		to train
			and to		wheelchair
			investigate		capacity in the
			whether RTW		context of
			can be		RTW."

	1	T		T	
			predicted from		
			wheelchair		
			capacity at		
			discharge from		
			inpatient		
			rehabilitation,		
			after		
			correction for		
			confounders."		
Krause et. al.,	USA	Gainfully	"To identify	Gender, Age	"Counselors can
2010 [78]	(HIC)	employed	demographic,	at injury,	use the results to
			injury,	Education.	help understand
			educational,		the extent to
			and vocational		which
			predictors of		characteristics
			labor force		are associated
			participation		with the
			(LFP) after		probability of
			spinal cord		successfully
			injury (SCI)		participating in
			performing		the labor force."
			secondary		
			analysis of		
			existing data."		

Table 2.1: Summary of Findings (SOF) for continuous factors

Factor			Mean	95% CI	P-value	Quality
	No. of P	articipants	difference			of
	Employed	Unemployed				evidence
FIM Score	570	1406	0.67	0.49 to 0.85	<0.01	Medium
Being young at the time of injury	1576	2097	-0.30	-0.46 to -0.14	<0.01	Low
Being young at the time of data collection	2783	4900	-0.24	-0.38 to -0.11	<0.01	Low
More time since injury	1533	2904	0.31	0.12 to 0.49	<0.01	Low

Table 2.2: Summary of findings (SOF) for Nominal factors

Factor	No. of Participants		OR (95% CI)	P-	Quality
				value	of
	Employed	Unemployed			evidence
Being able to live alone	1219	1901	2.59 (1.29 to 5.10)	0.01	Low
Ability to drive	317	347	4.76 (2.94 to 7.61)	<0.01	Low
Having annual income of	491	1000	0.15 (0.06 to 0.34)	<0.01	Low
≥\$20,000					
Having education of ≥High	9646	10697	0.45 (0.36 to 0.57)	<0.01	Low
school					
Being White	7808	15384	2.16 (1.54 to 3.03)	<0.01	Low
Being Male	12933	18147	1.09 (0.94 to 1.28)	0.23	Low
Being married	9325	11042	1.54 (1.06 to 2.23)	0.02	Medium

Being paraplegic	4279	5097	0.73 (0.63 to 0.85)	<0.01	Medium
Having complete injury	1758	2161	0.83 (0.65 to 1.05)	0.12	Medium
Being employed pre-injury	948	1988	1.84 (0.86 to 3.90)	0.12	Low
Being employed at the time of injury	217	169	1.35 (0.36 to 5.00)	0.65	Low
Пјигу					
Having low pre-injury work	427	412	1.43 (0.76 to 2.66)	0.26	Low
intensity					
Medical co-morbidities	11981	10510	0.64 (0.35 to 1.19)	0.16	Low
Present					
Being able to use Wheelchair	344	581	0.44 (0.20 to 0.96)	0.04	Low
Received vocational training	185	252	1.80 (0.93 to 3.46)	0.08	High

Table 3.1: ICF structure of factors that were explored

Body structure and function	Activity	Participation	Personal factors	Environme ntal factors
Types of injury Level of injury Beck Depression Inventory (BDI) Body Mass Index (BMI) Medical comorbidities Pain/spasticity/UTI/sleep/fatigue/ Bowel-bladder incontinence	Ability to live alone Ability to drive Wheelchair use Mobility Functional Independen	Education after injury Participation in community Being member of social association	Gender Marital status Ethnicity Age at the time of data collection Age at injury	Unable to access medical care Architectura 1 barrier Insurance Welfare subsidy

Co-occurring	disability	ce Measure	Participation	Time since	RTW
Alcohol/drug	abuse and	(FIM)	in organized	injury	support
Psychiatric disabi	ility		sports Vocational	Education level before injury	Financial incentives
			training	Employment	Work
				pre-injury	disincentives
				Employment at	Family/socia
				the time of	1 support
				injury	Area level
				Pre-injury	characteristi
				work intensity	cs
				Annual income	
				Economic class	
				Self-	
				motivation/	
				self-efficacy	
				Perceived	
				health	
				Life	
				satisfaction	
				Job expectation	
				Means of	
				injury	

	Industrial	
	accident	
	D	
	Re-	
	hospitalization	

Table 3.2: ICF structure of factors that qualified for meta-analysis

Body structure and function	Activity	Participation	Personal factors
Types of injury Level of injury Medical comorbidities	Ability to live alone Ability to drive Wheelchair use Functional Independence Measure (FIM)	Vocational training	Gender Marital status Ethnicity Current age Age at injury Education level Annual income Employment preinjury Employment at the time of injury

	Pre-injury v	vork
	intensity	
	Time since injury	

Appendix C

Search Strategy:

Ovid MEDLINE(R) ALL 1946 to April 25, 2022

Date searched April 26, 2022

Results: 1345

1. exp Spinal Cord Injuries/

2. hemiplegia/ or exp paraplegia/ or quadriplegia/

3. (Spinal cord injur* or (paraplegi* not spastic paraplegi*) or (quadraplegi* not spastic

quadriplegi*) or (hemiplegi* not spastic hemiplegi*) or spinal paralys* or spinal cord

paralys*).mp.

4. 1 or 2 or 3

5. work/ or exp return to work/

6. employment/ or employment, supported/ or workplace/ or occupations/

7. ("Return* to work" or work re-entry or work reentry or community integration or

community reintegration or vocational or labor market or labour market or job market or

workplace* or "place of work" or job accommodation* or work accommodation* or supported

employment or work* capacity or job characteristics or reasonable accommodation* or job

modification* or work modification* or employment status or occupational status or employment

rate* or re-employ* or reemploy*).mp.

((back or return* or resum* or reentry or re-entry or re-enter) adj3 (work* or employ* or 8.

vocation*)).mp.

9. (job or jobs or work or (worker* not worker* compensation) or workplace or (working not

working memory) or (occupation* not (occupational therap* or occupational performance*)) or

vocation* or employ*).ti,kf.

85

10. 5 or 6 or 7 or 8 or 9

11. 4 and 10

EMBASE

Embase 1974 to 2022 April 25

Date searched: April 26, 2022

Results: 2389

1. exp spinal cord injury/

2. hemiparesis/ or hemiplegia/ or paraplegia/ or quadriplegia/ or spinal paralysis/

3. (Spinal cord injur* or (paraplegi* not spastic paraplegi*) or (quadraplegi* not spastic quadriplegi*) or (hemiplegi* not spastic hemiplegi*) or spinal paralys* or spinal cord

paralys*).mp.

4. 1 or 2 or 3

5. return to work/ or work/

6. employment/ or occupation/ or full time employment/ or parttime employment/ or self

employment/ or sheltered employment/ or supported employment/

7. ("Return* to work" or work re-entry or work reentry or community integration or

community reintegration or vocational or labor market or labour market or job market or

workplace* or "place of work" or job accommodation* or work accommodation* or supported

employment or work* capacity or job characteristics or reasonable accommodation* or job

modification* or work modification* or employment status or occupational status or employment

rate* or re-employ* or reemploy*).mp.

8. ((back or return* or resum* or reentry or re-entry or re-enter) adj3 (work* or employ* or

vocation*)).mp.

86

9. (job or jobs or work or (worker* not worker* compensation) or workplace or (working not

working memory) or (occupation* not (occupational therap* or occupational performance*)) or

vocation* or employ*).ti,kf.

10. 5 or 6 or 7 or 8 or 9

11. 4 and 10

APA PsycInfo 1806 to April Week 3 2022

Date searched: April 26, 2022

Results: 428

1. exp spinal cord injuries/

2. hemiplegia/ or hemiparesis/ or paraplegia/ or quadriplegia/

(Spinal cord injur* or (paraplegi* not spastic paraplegi*) or (quadraplegi* not spastic 3.

quadriplegi*) or (hemiplegi* not spastic hemiplegi*) or spinal paralys* or spinal cord

paralys*).mp.

4. 1 or 2 or 3

5. reemployment/

6. employment status/ or self-employment/ or supported employment/

7. ("Return* to work" or work re-entry or work reentry or community integration or

community reintegration or vocational or labor market or labour market or job market or

workplace* or "place of work" or job accommodation* or work accommodation* or supported

employment or work* capacity or job characteristics or reasonable accommodation* or job

modification* or work modification* or employment status or occupational status or employment

rate* or re-employ* or reemploy*).mp.

87

- 8. ((back or return* or resum* or reentry or re-entry or re-enter) adj3 (work* or employ* or vocation*)).mp.
- 9. (job or jobs or work or (worker* not worker* compensation) or workplace or (working not working memory) or (occupation* not (occupational therap* or occupational performance*)) or vocation* or employ*).ti.
- 10. 5 or 6 or 7 or 8 or 9
- 11. 4 and 10

Scopus

Date searched: April 26, 2022

Results 1824

TITLE-ABS-KEY (spinal-cord-injur* OR (paraplegi* AND NOT spastic-paraplegi*) OR (quadraplegi* AND NOT spastic-quadriplegi*) OR (hemiplegi* AND NOT spastichemiplegi*) OR spinal-paralys* OR spinal-cord-paralys*) AND (TITLE-ABS-KEY (work" OR work-re-entry OR work-reentry OR communityintegration OR community-reintegration OR vocational OR labor-market OR labourmarket OR job-market OR workplace* OR "place of work" OR iobaccommodation* OR work-accommodation* OR supported-employment OR work*capacity OR job-characteristics OR reasonable-accommodation* OR iobmodification* OR work-modification* OR employment-status OR occupationalstatus OR employment-rate* OR re-employ* OR reemploy*) OR TITLE-ABS-KEY ((back OR return* OR resum* OR re-entry OR reentry OR re-enter) W/3 (work* OR employ* OR vocation*)) OR TITLE (job OR jobs OR work OR (worker* AND NOT worker*-compensation) OR workplace OR (working AND NOT working-memory) OR (occupation* AND NOT occupationaltherap* OR occupational-performance*)) OR vocation* OR employ*))

CINAHL Plus with Full text

Date searched: April 26, 2022

Results: 1355

S1. (MH "Spinal Cord Injuries+")

S2. (MH "Paraplegia+") OR (MH "Hemiplegia") OR (MH "Quadriplegia")

S3. (Spinal-cord-injur* or (paraplegi* not spastic-paraplegi*) or (quadraplegi* not spastic-quadriplegi*) or (hemiplegi* not spastic-hemiplegi*) or spinal-paralys* or spinal-cord-paralys*)

S4. S1 OR S2 OR S3

S5. (MH "Job Characteristics") OR (MH "Job Re-Entry")

S6. (MH "Job Accommodation") OR (MH "Employment, Supported") OR (MH "Employment") OR (MH "Employment of Persons with Disabilities")

S7. (MH "Occupation (Human)")

S8. ("Return* to work" or work-re-entry or work-reentry or community-integration or community-reintegration or vocational or labor-market or labour-market or job-market or workplace* or "place of work" or job-accommodation* or work-accommodation* or supported-employment or work* capacity or job-characteristics or reasonable-accommodation* or job-modification* or work-modification* or employment-status or occupational-status or employment-rate* or re-employ* or reemploy*)

S9. ((back or return* or resum* or re-enter or re-entry or reentry) N3 (work* or employ* or vocation*))

S10. TI(job or jobs or work or (worker* not worker*-compensation) or workplace or (working not working-memory) or (occupation* not (occupational-therap* or occupational-performance*)) or vocation* or employ*)

S11. S5 OR S6 OR S7 OR S8 OR S9 OR S10

S12. S4 AND S11