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International Comparison of Vocational Rehabilitation for Persons With Spinal Cord Injury: Systems, Practices, and Barriers

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Background: Employment rates among people with spinal cord injury or spinal cord disease (SCI/D) show considerable variation across countries. One factor to explain this variation is differences in vocational rehabilitation (VR) systems. International comparative studies on VR however are nonexistent. **Objectives:** To describe and compare VR systems and practices and barriers for return to work in the rehabilitation of persons with SCI/D in multiple countries. **Methods:** A survey including clinical case examples was developed and completed by medical and VR experts from SCI/D rehabilitation centers in seven countries between April and August 2017. **Results:** Location (rehabilitation center vs community), timing (around admission, toward discharge, or after discharge from clinical rehabilitation), and funding (eg, insurance, rehabilitation center, employer, or community) of VR practices differ. Social security services vary greatly. The age and preinjury occupation of the patient influences the content of VR in some countries. Barriers encountered during VR were similar. No participant mentioned lack of interest in VR among team members as a barrier, but all mentioned lack of education of the team on VR as a barrier. Other frequently mentioned barriers were fatigue of the patient (86%), lack of confidence of the patient in his/her ability to work (86%), a gap in the team's knowledge of business/legal aspects (86%), and inadequate transportation/accessibility (86%). **Conclusion:** VR systems and practices, but not barriers, differ among centers. The variability in VR systems and social security services should be considered when comparing VR study results. **Key words:** employment, spinal cord diseases, spinal injuries, work

Persons sustaining spinal cord injury or disease (SCI/D) usually undergo extensive multidisciplinary rehabilitation with the aim of optimal participation in the community, including return to work. Work participation (WP) generates income and is beneficial for other reasons, including self-esteem and quality of life.¹⁻³ Employment rates among people with SCI/D, with an average of 34% (range, 15%-76%) and an average full-time employment rate of 21%, are well below those among the general population.⁴

Determinants for WP following SCI/D have been described and include the following factors

favoring employment: demographic characteristics at time of injury (being young, male, married, or White), injury-related factors (less time since injury, lower level of injury/impairment, higher functional status, and less medical complications), employment-related determinants (higher education, involved employer, and office work), psychosocial (motivation, receiving social and environmental support), and rehabilitation-related factors (vocational rehabilitation).⁵⁻⁹ Barriers for WP in SCI/D include lack of transportation, lack of benefits, having no time off for health-related concerns or difficulty accessing health care,

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and biases held by employers and others in the workforce about the capabilities of persons with disabilities.^{5-7,9}

How medical rehabilitation adds to successful WP is unclear, and there is a need for developing interventions aimed at WP following SCI.^{10,11} Vocational rehabilitation (VR), defined as a “multi-professional evidence-based approach that is provided in different settings, services, and activities to working age individuals with health-related impairments, limitations, or restrictions with work functioning, and whose primary aim is to optimize work participation,”^{12(p130)} could be helpful to optimize WP outcomes. Prompt involvement with VR is important.¹³⁻¹⁵ It is known that availability of job placement services by a vocational counselor, including provision of information on appropriate jobs, contributes to successful WP.¹⁶ Combining these factors would logically lead to earlier integration of VR into the rehabilitation process. This is however not obvious; people with SCI/D might need a prolonged period of rehabilitation for functional recovery, which leads to VR practices often commencing late. When the start of VR is delayed, a window of opportunity in preserving preinjury employment or assisting in vocational decision making is potentially missed.^{13,14,17}

The aim of this study was to explore similarities and differences between VR systems, practices, and barriers (including social security services) for persons with SCI/D among countries and centers in the initial rehabilitation period. Our hypothesis is that country- and center-specific systems and practices differ greatly.

Methods

Design

The descriptive cross-sectional study was conducted in seven countries (Australia, Belgium, Canada, Ireland, Italy, the Netherlands, and Switzerland). Collaboration on this study started in September 2016. Data collection took place between April 2017 and August 2017.

Participant site selection

Participating centers were selected based on existing international research collaborations.¹⁸

All centers had sufficient expertise in the field of SCI/D, which was defined by admitting at least 40 newly injured persons with SCI/D per year. Information was sought from VR experts in each center, further mentioned as the participant.

Measures

A questionnaire was developed by the main authors (E.H.R., M.F.R., and M.W.M.P.) based on their expertise in VR and relevant literature. The questionnaire was built with the aim of collecting information on VR practices and barriers of the center using Krause’s barriers to work questionnaire¹⁹ as a background. The questionnaire was discussed with all coauthors to ensure its applicability before use. The final questionnaire contained four parts: center characteristics, system characteristics including social security benefit schemes, VR practices including two clinical case examples, and barriers encountered during VR. A copy of the questionnaire is seen in the **Appendix**.

Questions on typical VR practices in the centers were based on two case examples that were presented to the participants: a 30-year-old male with an office job who sustained a C7 complete SCI, American Spinal Cord Injury Association Impairment Scale (AIS) A, and a 60-year-old male with a manual job who sustained a C7 complete SCI, AIS A.²⁰ Both cases were very motivated to return to work and indicated that at the start of the rehabilitation process. By choosing two cases with similar SCI characteristics but diverging return-to-work expectations based on their age and preinjury employment situation, we aimed to reveal differences in VR policies within and between the participating centers. Two cases with complete tetraplegia were chosen to represent a clearly defined high level of complexity (wheelchair dependence, poor balance, and limited hand function).

Questions on barriers were based on the six primary themes of Krause’s barriers to work questionnaire¹⁹: resources (education/training, transportation, and other resources), health status (stamina, endurance, and fatigue), disability considerations (inaccessibility, employer bias [eg, reluctance to hire people with disabilities], knowledge of appropriate jobs), lack of importance (no interest in working, having had a large settlement, family influence, and doing other

important activities), disincentives (financial and medical benefits), and motivation (value placed on working, and confidence in ability to work). In addition to these themes that focused on the client, we added questions on the same themes but that focused on the team: resources (team's education/training), disability considerations (team's knowledge of appropriate jobs, team's knowledge of medical condition), lack of importance (no interest in VR, priority to other rehabilitation interventions), and motivation (value placed on WP, and confidence in ability to contribute to WP).

Furthermore, respondents were asked with open questions to list their top three most commonly experienced barriers to WP on admission and on discharge of clinical rehabilitation.

Data collection

Each center could choose the team member(s) most involved in or responsible for VR as provider of the information if, for example, no vocational rehabilitation counselor (VC) was available. They completed the questionnaire, and their responses were reviewed by the main author. If responses were doubtful, discussion with the second and last authors (M.F.R., M.W.M.P.) followed. If still unclear, clarification was asked from the response provider.

Analysis

Descriptive analyses of the responses were performed. Answers on open questions were coded afterward as far as possible in categories according to Krause's themes¹⁹ by the first author (E.H.R.). Occasionally an answer was classified in two categories. The questionnaire was sent back and forth to the centers until full completion resulted in no missing data.

Ethics

This study did not involve patients, and therefore no ethical approval was needed in the country of the leading center (the Netherlands).

Study size

Two out of the nine centers that were invited to participate in this study declined participation,

because VR was not routinely part of the initial inpatient rehabilitation in SCI/D (Department of Physical Medicine & Rehabilitation, Mayo Clinic College of Medicine, Rochester, USA) or time constraints (The National Spinal Injuries Center, UK).

Results

Center characteristics

Table 1 shows the characteristics of the seven centers that completed the survey.

The information provider differed per country as not all centers had a VC integrated in the rehabilitation setting and the lead or responsibility of VR differed per center.

Social security services and VR system

The details on social security services and VR systems in each country are summarized in **Table 2**. A public system of income compensation for disability in SCI/D is in place in all countries. In several countries, income compensation is dependent on the etiology of the SCI/D (traumatic or nontraumatic and occupational or nonoccupational), the type of employment (employee or self-employed), or other variables such as living circumstances and time since injury. Most, but not all, countries also have a private income compensation system in place, for example, for self-employed or additional income protection insurance. The eligibility for income compensation is mainly dependent on the impairment level or the work capacity and is decided by medical experts. Permanent compensation until retirement is available in all country sites that participated in this study. The amount of compensation depends on previous earnings, type of system (public or private), and other factors such as living circumstances and previous tax contributions. In most countries, a maximal compensation rate is set, which is often similar or lower when compared to the median income in the respective country. If persons return to work, depending on the new earnings and the system that is in place, persons might partially or completely lose their income compensation.

Table 1. Center characteristics

Country/center	Respondent	Recent SCI/D admitted/year, n ^a	SCI/D beds, n ^a	VR department	VC present in team
Australia/ Caulfield Hospital, Alfred Health	Medical doctor	50	12	Yes ^b	Yes ^b
Belgium/ University Hospitals Leuven	Occupational therapist	40	20	No	No
Canada/ GF Strong Rehabilitation Centre	VC	110	22	Yes	Yes
Ireland/ National Rehabilitation Hospital	Social worker	130	36	Yes	Yes
Italy/ Institute for Research and Health Care Fondazione S.Lucia	Medical doctor and social worker	80	24	No	Yes
The Netherlands/ University Medical Center Groningen Center for Rehabilitation	VC and medical doctor	65	20	Yes	Yes
Switzerland/ Swiss Paraplegic Centre	VC and medical doctor	100	150	Yes	Yes

Note: VC = vocational rehabilitation counselor; VR = vocational rehabilitation.

^aApproximate number.

^bNot available to everyone.

Table 2. Details on social security services and vocational rehabilitation per country

	Australia	Belgium	Canada	Ireland	Italy	Netherlands	Switzerland
Public system of IC differs depending on:							
Etiology (TI [OI - non-OI]; non-TI)	Yes (for MVA and OI)	Yes (for OI)	No	No	Yes (for OI)	No	Yes
Type of employment (employee; self-employed)	No	Yes	No	No	Yes	Yes	No
Other		Living circumstances			TSI	TSI	TSI
Private system of IC differs depending on:					No private system		
Etiology (TI [OI - non-OI]; non-TI)	No	Yes	No	No	NA	No	Yes
Type of employment (employee; self-employed)	No	Yes	No	No	NA	Yes	No
Other					NA		TSI
What decides eligibility for IC?	WC	IL, WC	IL	WC	IL, WC	WC	WC
Who decides eligibility for IC?	Medical expert	Medical expert	Agency providing IC	Medical expert (from private insurance or government)	Medical expert	Medical expert (and vocational expert for self-employed)	Medical expert

Table 2. Center characteristics (CONT.)

	Australia	Belgium	Canada	Ireland	Italy	Netherlands	Switzerland
Possibility of permanent IC until retirement	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Amount of IC depending on:							
Previous earnings	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Type of system	Yes (additional if private)	Yes (different for OI)	Yes (different for OI)	Yes	Yes	Yes	Yes
Other			Funding (national vs local)	Previous income, tax contributions	TSI; WC, age, sex, career perspectives, no. of years WP, and living circumstances in OI		Age
National set maximum rate of IC present	Yes	Yes	Yes for public	Yes	Yes	Yes if public; no if private	Yes
Maximum IC compared to the median income	Maximum 75% of previous income or at disability pension rate	Similar/lower	Lower	Similar to unemployment	Similar	Higher	Lower
Can people lose IC if WP?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Depending on amount of IC	Yes	Yes	Yes	Yes	Yes	Yes	Yes
If public IC	Yes	Yes	Yes	Yes	Yes		Yes
If private IC	Yes	Yes	Unknown	Yes	No		Yes
Depending on other		Yes, (eg, when family situation changes)	No	“partial capacity benefit” in case of WP following absence			Yes
Can people fully lose IC when WP?	Yes	Yes; no if OI	Yes	Yes	Yes; no if OI	Yes	Yes
VR during IR	No	Yes	Yes	Yes	Yes	Yes	Yes
VR after IR	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Funding of VR during IR	State or compensation program (MVA or occupational trauma)	Community, hospital, insurance	Community, RC	RC	Community	Insurance, employer	Insurance, Swiss Paraplegic Association
Funding of VR after IR	State	Community, hospital, insurance	Public and private	RC (government funded)	Not available	Employer, insurance	Insurance, Swiss Paraplegic Association
Place of VR	RC, community	RC, community, specific VR center	RC	RC	RC	Specific RC	RC, community, insurance

Note: IC = income compensation; IL = impairment level; IR = inpatient rehabilitation; MVA = motor vehicle accident; n = number; OI = occupational injury; RC = rehabilitation center; TI = traumatic injury; TSI = time since injury; VR = vocational rehabilitation; WC = work capacity; WP = work participation.

Most countries offer VR during and after inpatient rehabilitation, however location (eg, rehabilitation center, community) and funding (eg, rehabilitation center, community, government, hospital insurance) of the VR programs differ.

Vocational rehabilitation practices

When comparing the two cases, we observed that the age of the patient and the preinjury occupation might influence the content of VR in some centers more than in others. The differences in VR practices between the two clinical case examples in the participating countries are shown in **Table 3**.

Case 1 is a 30-year-old male with an office job who sustained a C7 complete SCI (AIS A) and indicated clearly at the start of his inpatient rehabilitation that he was very motivated to return to work as soon as possible. Three out of 7 (43%) centers consider VR and WP to be an important goal and would start VR as soon as possible. In the Netherlands, for this patient, VR would be initiated on admission in the rehabilitation center. In Switzerland (Swiss Paraplegic Centre), VR starts, if medically possible, with first contact with the VR team during the patient's stay at the intensive care unit. The other centers consider VR to be important but would wait until the first team meeting before deciding to start. In Australia, depending on the expected feasibility to return to the previous type of employment, VR might be initiated during inpatient rehabilitation or at inpatient discharge. In Ireland and the Netherlands, for this case, the initiative of the patient is decisive in setting the goal of WP. VR is mostly initiated by the team, but the medical lead (Netherlands, Switzerland) or the occupational therapist (Belgium) can also initiate VR. The lead of the VR is mostly taken by the vocational counselor, however the occupational therapist (Belgium) or the social assistant (Italy) can also lead VR. As for financing the VR for the above case, the rehab center (in 43% of centers) or the health insurance (in 43% of centers) funded the VR; the Swiss Paraplegic Association may fund VR in Switzerland. In Australia, a special VR program for SCI/D exists at some centers and will finance the VR.

Case 2 is a 60-year-old male with a manual job who sustained a C7 complete SCI (AIS A) and who indicated clearly at the start of his rehabilitation that he was very motivated to return to work as soon as possible. Two out of seven (29%)

centers would start VR as soon as possible. In the Netherlands, for this patient, VR would be initiated on admission. In Switzerland (Swiss Paraplegic Centre), VR starts, if medically possible, with first contact with the VR team during the patient's stay at the intensive care unit. Three out of seven (43%) centers find VR an important goal; however they would wait until the first team meeting before deciding to start. In Australia and Italy, VR is not prioritized in this case and would be initiated at discharge. In Ireland, Italy, and the Netherlands, for this case, the initiative of the patient is decisive in setting the goal of WP. VR is initiated by the same team members for case 2 as for case 1 for all centers. The VR lead for case 2 is the same as in case 1 for all centers except Australia, where the lead is taken by the case manager instead of the vocational counselor. As for financing the VR for case 2, the same institutions are funding the VR as for case 1.

Encountered barriers

The patient- and team-related barriers encountered during VR are shown in **Table 4**. All participants (except one who stated this barrier as not applicable) mentioned lack of education of the team on VR as a barrier. Other frequently encountered barriers to VR were fatigue of the patient (86%), lack of confidence of the patient in his/her ability to work (86%), inadequate transportation and accessibility (86%), and a gap in the team's knowledge of business/legal aspects (86%). Other, but less often (71%) encountered, barriers were limitations in the patient's education, patient's lack of knowledge of appropriate jobs, poor patient endurance, employer's bias, priority of other rehabilitation activities by the team, and financial benefit. The lack of interest in VR by the team was not reported as a barrier by any center; one center (14%) reported the team's knowledge of the medical condition and the family influence to be a barrier.

In the answers from the open questions on barriers to WP on inpatient rehabilitation admission and discharge, medical conditions such as not being medically fit or having an unclear prognosis were described as the most common barriers at admission (47% of mentioned barriers on admission), followed by resources such as knowledge and education (17%); lack of importance (14%), for example, priority on other rehabilitation activities; and motivation (14%). At the time of discharge

Table 3. Clinical cases

	Australia	Belgium	Canada	Ireland	Italy	Netherlands	Switzerland
CASE 1							
Importance of VR as a goal	Important; depends on team decision; start after first team meeting	Important; start asap after admission	Important; depends on team decision; start after first team meeting	Important; depends on team decision and patient initiative	Important; depends on team decision; start after first team meeting	Important; depends on patient initiative; start asap after admission	Important; start asap after admission
When is VR initiated?	During IR; toward or at discharge ^a	During IR; however intake asap	During IR	During IR	During IR	Admission	asap during IR; first contact in ICU
Who initiates VR?	Team	OT or team	Team	Team and patient	Team	Team or medical lead	Medical doctor
Who leads VR?	VC	OT	VC	VC	Social assistant	VC	VC
Who finances VR?	Special programs	Health insurance	RC	RC	RC	Health insurance	Health insurance; Swiss Paraplegic Association
CASE 2							
Importance of VR as a goal	Not important	Important; depends on team decision; start after first team meeting	Important; depends on team decision; start after first team meeting	Important; depends on team decision and patient initiative	Important; depends on patient initiative	Important; depends on patient initiative; start asap after admission	Important; start asap after admission
When is VR initiated?	At discharge	During IR	During IR	During IR	At discharge	Admission	asap during IR; first contact in ICU
Who initiates VR?	Team	OT or team	Team	Team and patient	Team	Team or medical lead	Medical lead
Who leads VR?	Case manager	OT	VC	VC	Social assistant	VC	VC
Who finances VR?	Special programs	Health insurance	RC	RC	RC	Health insurance	Health insurance; Swiss Paraplegic Association

Note: asap = as soon as possible; ICU = intensive care unit; IR = inpatient rehabilitation; OT = occupational therapist; RC = rehabilitation center; VC = vocational counselor.

^aDepending on feasibility to return to previous type of employment.

from inpatient rehabilitation, medical conditions such as medical complications (29%) together with lack of importance (26%) and disability considerations (26%), for example, workplace accessibility, were seen as the most common barriers followed by resources (14%).

Discussion

This study is the first to compare current VR practices of persons with SCI/D during inpatient rehabilitation between multiple countries. Our

study confirms that VR practices differ, which could lead to difference WP outcomes. In fact, this study indicates that the timing and content of VR programs differs among countries; some centers postpone VR of a more challenging patient (case 2) toward discharge, when a case manager/team becomes involved. Another rationale for this might be that VR for this case is expected to be more complex as he/she will not be able to return to pre-SCI/D employment. Others have shown that it takes significantly longer for an individual to retrain for WP when compared to someone who

Table 4. Patient and team barriers during vocational rehabilitation

	Australia	Belgium	Canada	Ireland	Italy	Netherlands	Switzerland	Yes per barrier, <i>n</i> (%)
Resources barriers								
Educational level of the patient	Yes	Yes	Yes	No	Yes	No	Yes	5 (71%)
Training of the patient	Yes	Yes	No	Yes	No	Yes	No	4 (57%)
Transport of the patient	Yes	Yes	Yes	Yes	Yes	No	Yes	6 (86%)
Other patient resources			Funding					
Education of the team	Yes	Yes	N/A	Yes	Yes	Yes	Yes	6 (100%)
Training of the team	Yes	Yes	N/A	No	No	Yes	Yes	4 (67%)
Health status barriers								
Endurance of the patient	Yes	Yes	Yes	No	No	Yes	Yes	5 (71%)
Stamina of the patient	Yes	No	Yes	No	No	Yes	Yes	4 (57%)
Fatigue of the patient	Yes	Yes	Yes	No	Yes	Yes	Yes	6 (86%)
Other health and patient related barriers	MC		MC	MC				
Disability considerations barriers								
Accessibility of work environment	Yes	Yes	Yes	Yes	Yes	No	Yes	6 (86%)
Employer bias	Yes	Yes	Yes	No	No	Yes	Yes	5 (71%)
Patient's knowledge of appropriate jobs	Yes	No	Yes	No	Yes	Yes	Yes	5 (71%)
Team's knowledge of business/legal aspects	Yes	Yes	Yes	No	Yes	Yes	Yes	6 (86%)
Team's knowledge of medical condition	No	No	No	No	No	No	Yes	1 (14%)
Other disability and patient-related barriers				WP access				
Lack of importance								
No interest in working by the patient	Yes	No	N/A	No	Yes	Yes	Yes	4 (67%)
Patient having had a large settlement	No	Yes	N/A	Yes	No	No	No	2 (33%)
Family influence	No	Yes	N/A	No	No	No	No	1 (14%)
Patient doing other important activities	No	Yes	N/A	Yes	No	No	No	2 (33%)
Other important and patient-related barriers	Age/retirement plans							
No interest in VR by team	No	No	No	No	No	No	No	0 (0%)
Priority to other rehabilitation by team	No	Yes	Yes	No	Yes	Yes	Yes	5 (71%)
Other important and team-related barriers				Patient not ready				
Disincentives								
Medical benefit	No	No	Yes	Yes	Yes	No	No	3 (43%)
Financial benefit	Yes	Yes	Yes	Yes	Yes	No	No	5 (71%)

(continued)

Table 4. Patient and team barriers during vocational rehabilitation (CONT.)

	Australia	Belgium	Canada	Ireland	Italy	Netherlands	Switzerland	Yes per barrier, <i>n</i> (%)
Other disincentive-related barriers			Economy, housing					
Motivation								
Value placed on working by patient	No	No	Yes	No	No	Yes	Yes	3 (43%)
Value placed on working by team	No	No	Yes	No	No	Yes	Yes	3 (43%)
Confidence in ability to work by patient	Yes	Yes	Yes	No	Yes	Yes	Yes	6 (86%)
Confidence in ability to work by team	No	Yes	Yes	No	Yes	No	Yes	4 (57%)
Other motivation and patient-related barriers			Money, status	Adjustment			N/A	
Yes per country, <i>n</i>	15	17	16	8	13	14	8	

Note: MC = medical complications; N/A = not applicable.

returns to pre-SCI/D employment.²¹ Additionally, VR is probably considered less successful for those cases based on literature indicating that age, level of injury, and more practical education/manual job are negatively related to WP.^{6,22-24} Conversely, one might argue against the later commencement of VR in challenging cases and consider earlier commencement of VR to be important to optimize VR and WP outcome as soon as possible.^{13-15,17} Our study confirms that the funding of the VR during and after inpatient rehabilitation and the location of VR are different among centers/countries, which also can lead to different WP outcomes.

We found that many determinants and barriers such as fatigue of the patient, transportation and accessibility, confidence in ability to work by the patient, team's education, and knowledge of business/legal aspects are similar across borders. Many of those barriers are potentially modifiable, implying that addressing barriers, such as accessibility and transportation, educating the team, and building up confidence, could potentially improve WP outcomes. This is in line with the literature confirming transportation to be an overall problem¹⁶ and ranking discrimination and inaccessibility of the workplace among the prominent negative environmental factors for WP.²⁵ Additionally, barriers such as patient's endurance, education, and knowledge of appropriate jobs; financial benefit; priority

regarding other rehabilitation activities by the team; and employer's bias were rather often mentioned but to a lesser extent. This implies that patient's education and involvement of the employer is desirable. Financial benefits have previously been described as a barrier in the literature. System characteristics of insurance schemes, income-protection arrangements, and socioeconomic characteristics of different countries can have a strong influence on WP rates.²⁶ In this study, 71% mentioned financial benefits to be a barrier. An inclusive approach with its emphasis on full community participation of persons with disabilities would likely result in enhanced WP in SCI rather than with reliance on compensation-oriented incentives alone.²⁶ It is known that disability spending in most countries is still biased toward passive benefit systems, which make up 95% and more of total spending in most countries; only a few countries (Denmark, Germany, the Netherlands, and Norway) spend more than 10% on the active labor market programs for persons with disability.²⁷ The WP rate for people with SCI/D in some of the aforementioned countries tends to be higher compared to the international average.^{23,28} Unfortunately, even if many barriers are modifiable, certain barriers (eg, transportation and education) are also dependent on available resources and systems, which makes it more difficult to address them fully during VR.

Our study confirms that the barriers to VR and WP vary in time during inpatient rehabilitation.^{24,29} Initially medical barriers such as fatigue, complications, and uncertainty about prognosis are the main experienced barriers; but by the time of discharge, medical complications, lack of importance, disability considerations such as accessibility, and knowledge of appropriate jobs as well as resources become more important barriers. Being aware of the dynamics in those barriers can guide us in optimizing VR.

Furthermore, when comparing results among studies, it is important to be aware that VR is performed differently in different countries and that nonmodifiable barriers, such as social security services, differ among them and possibly lead to different WP outcomes. It remains unclear whether the different approaches to VR depend on the philosophy of the particular center, the education of the team, or the country's legislation and funding sources. It would be interesting if future research would focus on the relationship between VR practices, social security services and VR systems, and WP outcomes.

Limitations

The selection of the participating centers was based on previous collaborations, leading to potential selection bias. For each country, only one SCI center participated in the study. National differences within countries exist, and therefore VR practice on a national level per country was not represented. Also the provider of information varied per center as not all centers had a VC integrated in the rehabilitation setting and the lead or responsibility of VR differed per center. The providers of information may not represent the approach taken by the team, which could lead to a subjective

interpretation of the situation and information bias. The participating countries were high income and western countries. This limits the generalizability of our findings. Finally, the two case examples did not fully represent the SCI/D population as incomplete SCI/D and paraplegia are not mentioned. We chose these cases because persons with tetraplegia are less likely to return to work, according to the literature. Our goal was to explore VR policies with respect to cases with diverging perspectives on WP. The two characteristics that defined the differences, age and preinjury employment, are also strongly related with WP.⁹

Conclusion

VR systems and practices such as funding, location, timing, and content of VR differ, however many experienced barriers are similar among centers. The compensation/benefit system differs among centers and countries; within a country, the amount of income compensation can differ depending on factors such as etiology of SCI/D or preinjury employment type. This variability in VR systems and social security services challenges generalizability and should be considered when comparing VR study results.

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APPENDIX

Questionnaire on Vocational Rehabilitation Practices and Barriers for Employment in Spinal Cord Injury Rehabilitation

A. Identification

1. COUNTRY	
2. STATE	
3. REHABILITATION CENTER NAME	
4. DEPARTMENT	
5. FUNCTION (eg, vocational counselor, occupational therapist, case manager, ...)	

B. Benefit Scheme

If available, please send us a flyer/brochure or give us name of a website with more information on the benefit scheme of your country/state.

12a. Does a system of income compensation for people unemployed due to disability exist in your country?	<input type="radio"/> Yes <input type="radio"/> No
12b. If yes on question 12a. Is this income compensation:	<input type="radio"/> Temporary <input type="radio"/> Permanent (until retirement)
12c. If yes on question 12a. What determines the level of the compensation? Please clarify. *eg, for the Netherlands:	
Inhabitants of the Netherlands are insured for medical care by law. In case of sick leave, employees are fully compensated during their first year on sick-leave, and at 70% of their last salary on the second year; the employer is responsible for these costs. After that period, the government provides a maximum compensation of 70% of their last salary for 2 years for the loss of work. If the employers do not collaborate sufficiently on worker's reintegration during the first 2 years of sick leave, they are responsible for the costs (not the government). Afterwards, the government supplies a compensation that may not reach the 70% of their last salary (minimum subsistence). *If website/brochure available, please mention or send: www...	
12d. If yes on question 12a. Is there a maximum compensation?	<input type="radio"/> Yes <input type="radio"/> No
12e. If yes on question 12a. How high can disability compensation be compared to the median income in your country?	<input type="radio"/> Higher <input type="radio"/> Lower <input type="radio"/> Similar <input type="radio"/> Other, please specify

(continued)

12f. If yes on question 12a. Do people lose their rights on income compensation when they return to work, under what circumstances yes or no?	<input type="radio"/> Yes: circumstances <input type="radio"/> No: circumstances
12g. If yes on question 12a. Can patients work (eg, part-time) and have a supplementary benefit?	<input type="radio"/> Yes <input type="radio"/> No
13. In your country, do return to work or education programs exist? **If website/brochure available, please mention or send:	<input type="radio"/> Yes <input type="radio"/> No
www....	
14. Who funds those programs?	<input type="radio"/> Private institutions <input type="radio"/> Community <input type="radio"/> Hospital <input type="radio"/> Others, please specify

C. Vocational rehabilitation-related questions

15. In your setting, is vocational rehabilitation (VR) mainly performed at:	<input type="radio"/> Rehabilitation center <input type="radio"/> Community <input type="radio"/> Specific VR center <input type="radio"/> Other, please specify
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Case 1: A 30-year-old man with an office job prior to SCI sustained a C7 complete SCI and is undergoing clinical rehabilitation at your center. Patient is very motivated to go back to work and clearly indicates that at the beginning of the rehab.

16. For the above patient, how important is vocal rehabilitation as a goal in the rehabilitation process?	<input type="radio"/> Not important <input type="radio"/> Important, however depends on initiative of the patient. <input type="radio"/> Important, however depends on the decision made by the team and therefore no VR is started until the first team meeting <input type="radio"/> Important and will be initiated asap after admission to the center. <input type="radio"/> Other, please specify
17. For the above patient, at what stage VR is initiated?	<input type="radio"/> At admission <input type="radio"/> During clinical rehabilitation <input type="radio"/> During rehabilitation toward discharge from your center (clinical admission) <input type="radio"/> At discharge from your inpatient rehabilitation <input type="radio"/> During outpatient rehabilitation from your center <input type="radio"/> After discharge from outpatient rehabilitation at your center <input type="radio"/> Other, please specify
18. For the above patient, who initiates the VR?	<input type="radio"/> The medical lead <input type="radio"/> The vocational lead <input type="radio"/> The occupational therapist <input type="radio"/> The case manager <input type="radio"/> Joined decision by team <input type="radio"/> Other, please specify
19. For the above patient, who is most likely to be the functional lead of the VR?	<input type="radio"/> The medical lead <input type="radio"/> The vocational lead <input type="radio"/> The occupational therapist <input type="radio"/> The case manager <input type="radio"/> Other, please specify
20. For the above patient, who is financing the VR?	<input type="radio"/> Rehabilitation center <input type="radio"/> Health insurance <input type="radio"/> Social security insurance (public) <input type="radio"/> Community <input type="radio"/> Private insurance <input type="radio"/> Employer <input type="radio"/> Other please specify

Case 2: A 60-year-old man with a manual job prior to SCI sustained a C7 complete SCI and is undergoing clinical rehabilitation at your center. Patient is very motivated to go back to work and clearly indicates that at the beginning of the rehab.

21. For the above patient, how important is vocational rehabilitation as a goal in the rehabilitation process?	<input type="radio"/> Not important <input type="radio"/> Important, however depends on initiative of the patient. <input type="radio"/> Important, however depends on the decision made by the team and therefore no VR is started until the first team meeting. <input type="radio"/> Important and will be initiated asap after admission to the center. <input type="radio"/> Other, please specify
22. For the above patient, at what stage VR is initiated?	<input type="radio"/> At admission <input type="radio"/> During rehabilitation <input type="radio"/> During rehabilitation towards discharge from your center (clinical admission) <input type="radio"/> At discharge from your center (clinical admission) <input type="radio"/> At end of outpatient rehabilitation from your center <input type="radio"/> After discharge from rehabilitation at your center <input type="radio"/> Other, please specify
23. For the above patient, who initiates the VR?	<input type="radio"/> The medical lead <input type="radio"/> The vocational lead <input type="radio"/> The occupational therapist <input type="radio"/> The case manager <input type="radio"/> Joined decision by team <input type="radio"/> Other, please specify
24. For the above patient, who is most likely to be the functional lead of the VR?	<input type="radio"/> The medical lead <input type="radio"/> The vocational lead <input type="radio"/> The occupational therapist <input type="radio"/> The case manager <input type="radio"/> Other, please specify...
25. For the above patient, who is financing the VR?	<input type="radio"/> Rehabilitation center <input type="radio"/> Health Insurance <input type="radio"/> Social security insurance (public) <input type="radio"/> Community <input type="radio"/> Private insurance <input type="radio"/> Employer <input type="radio"/> Other, please specify

D. Encountered barriers

Which patient-related barriers do you encounter often (approximately >50% of patients) during VR? More answers may apply.

26. Resources	<input type="radio"/> Education <input type="radio"/> Training <input type="radio"/> Transportation <input type="radio"/> Others, please specify <input type="radio"/> Not applicable
27. Health status	<input type="radio"/> Endurance <input type="radio"/> Stamina <input type="radio"/> Fatigue <input type="radio"/> Others, please specify <input type="radio"/> Not applicable
28. Disability considerations	<input type="radio"/> Accessibility of work environment <input type="radio"/> Employer bias (eg, employer will not hire because of disability,...) <input type="radio"/> Knowledge of appropriate jobs <input type="radio"/> Others, please specify <input type="radio"/> Not applicable

29. Lack of importance	<input type="radio"/> No interest in working <input type="radio"/> Having had a large settlement <input type="radio"/> Family influence <input type="radio"/> Doing other important activities <input type="radio"/> Others, please specify <input type="radio"/> Not applicable
30. Disincentives	<input type="radio"/> Medical benefit <input type="radio"/> Financial benefit <input type="radio"/> Others, please specify <input type="radio"/> Not applicable
31. Motivation	<input type="radio"/> Value placed on working <input type="radio"/> Confidence in ability to work <input type="radio"/> Others, please specify <input type="radio"/> Not applicable

Which team-related barriers do you encounter often (approximately >50% of patients) during VR ?

32. Resources	<input type="radio"/> Education in VR <input type="radio"/> Training in VR <input type="radio"/> Others, please specify <input type="radio"/> Not applicable
33. Disability considerations	<input type="radio"/> Knowledge of business and legal aspects of your state/country <input type="radio"/> Knowledge of the medical condition of the patient <input type="radio"/> Others, please specify <input type="radio"/> Not applicable
34. Lack of importance	<input type="radio"/> No interest in VR by team <input type="radio"/> Priority to other rehabilitation activities <input type="radio"/> Others, please specify <input type="radio"/> Not applicable
35. Motivation	<input type="radio"/> Value placed on working by team <input type="radio"/> Confidence in ability to work by team <input type="radio"/> Others, please specify <input type="radio"/> Not applicable

36. What do you experience as the most common barriers for return to work at time of admission on the rehabilitation ward? List top three.

37. What do you experience as common barriers for return to work at time of discharge of the rehabilitation ward? List top three.

E. Other open questions

38. Do you believe every admitted SCI patient gets the opportunities to undergo vocational rehabilitation?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Other, please specify
38a. If no on 38, what do you think influences this decision?	
39. In an ideal world, what do you think is needed for optimal return to work/education rate in persons with SCI?	
40. In your experience is the VR performed during inpatient rehabilitation important and decisive for work participation?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Other, please specify

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