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RESEARCH

Employment after Spinal Cord Injury in Norway: A Cross-Sectional Survey

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Two research questions are addressed: 1) What predicts employment among persons with spinal cord injury (SCI) in Norway? 2) How do the employed compare with the non-employed in their job motivation, labour discrimination, quality of life, everyday coping, health and pain suffering? We use a cross-sectional survey from 2012. With a 51% response rate, 320 Norwegians aged 21–66 years with SCI participated. After injury, 69.5% were employed, and 44.5% remained employed at the time of the interview. There was no gender difference in employment. Among men and women, age at onset of SCI, ability to continue working in the same organisation and education was associated with employment. For men paraplegia and vocational rehabilitation were also significant. Occupational class was non-significant among both men and women. Job motivation and work ability could have affected past employment, and both the employed and non-employed supported the statement that employers discriminate against wheelchair users.

Keywords: Spinal cord injury; Employment; Attitudes toward work; Quality of life; Norway

Introduction

People[1] with a disability are more often at risk of social exclusion from the labour market. This situation is reflected in lower employment rates, an overrepresentation of part-time contracts, and lower income compared with the general population. The employment rates of people with a spinal cord injury (SCI) differ between countries and studies but are generally reported as similar to the employment rates of people with a self-reported disability (OECD 2010; Ottomanelli & Lind 2009).

To understand the factors that influence individuals in and out of the labour market, we must ask how these processes operate in practice and why some disabled people are more often employed than others (Svanlund & Hansen 2013; Wik & Tøssebro 2014). Reduced work ability is the outcome of insufficient health to carry out job demands, and the role of employers to adjust job demands has been emphasised in previous research (Anvik 2006; Ramakrishnan, Mazlan, Julia & Latif 2011; Fekete, Wahrendorf, Reinhardt, Post & Siegrist 2014). The standard explanations for why people with SCI are not employed are inability to perform physically, loss of benefits, physical barriers (including inaccessibility of the workplace) (Young 2009; Ottomanelli & Lind 2009; Lidal, Huyhn & Biering-Sørensen 2007), coping strategies, and a lack of motivation and supportive supervisors (Abma, Bültmann, Varekamp & van der Klink 2013).

Less severe injuries, higher functional independence (Krause & Reed 2009; Krause & Reed 2011; Anderson & Vogel 2002; Tomassen, Post & van Asbeck 2000), SCI at a young age (Lidal, Huyhn & Biering-Sørensen 2007), and higher education (human capital) increase the chances to remain in employment (Krause & Reed 2009; Krause, Saunders & Acuna 2012). Studies that include occupational class report a social gradient in employment and general living conditions for people with SCI (Ferdiana, Post, Van de Groot, Bültmann & van der Klink 2014). Although education could be considered an indicator of occupational class, there are few SCI studies with an explicit class perspective, which could be considered a shortcoming. Professionals could have a better chance of being employed after SCI than

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unskilled or skilled workers in manual jobs, due to more job autonomy and flexibility, making it easier to continue working in the same profession despite reduced work ability. Furthermore, at either end of the social strata we can also assume there is a difference between the professionals with higher and lower tertiary education, and between skilled and unskilled workers, where those with more education or skills have more human capital to offer in the labour market. This could make employers more willing to invest in facilities or organise the work in ways that improve the job situation for those with valuable human capital but reduced work ability.

Although women with a disability are less likely to be employed in most developed economies, the situation is less obvious among women with SCI in Norway (Ottomanelli & Lind 2009) or the other Nordic countries (Valtonen, Karlsson, Alaranta & Viikari Juntara 2006; Lidal, Hjeltnes, Røislien, Stanghelle & Biering-Sørensen 2009). We would therefore expect a small gender difference in employment among individuals with SCI, but because the Norwegian labour market is strongly gender segregated with more men working in the private sector (Jensberg, Mandal & Solheim 2012), it is possible that predictors of employment among individuals with SCI are stronger among men than among women.

Summary of hypotheses

H1. Men and women are equally likely to be employed.
H2. Employment decreases by age.
H3. Employment decreases by age at the onset of SCI (unless so young that the SCI may have affected studies and the chance of gaining a first job).
H4. Individuals with paraplegia are more likely to be employed than individuals with tetraplegia.
H5. Those with a complete SCI are less likely to be employed.
H6. Vocational training or support as part of the rehabilitation process increases the employment among those in need of such training.
H7. Continuing to work in the same organisation as before the SCI increases employment.
H8. Secondary and tertiary education increases employment.
H9. Those from higher social strata of occupational class are more likely to be employed.
H10. Labour market predictors are stronger for men than women.
H11. A difference between the non-employed and the employed at the time of interview in work ability, pain suffering, resources to maintain a job, job motivation, sense of employer discrimination and quality of life could suggest these factors are also associated with past or present employment.

Methods

Sample and research design

This study is part of the survey "International Labour Market Integration Assessment in SCI" (ILIAS-SCI), collected in 2012 in Denmark, the Netherlands, Norway and Switzerland. The Norwegian data are based on a survey sent to all members of the Norwegian association for spinal cord injury (LARS) with SCI (18–67 years old). The study was approved by the Regional Ethical Committee and the Norwegian Social Science Data Archive. Three hundred twenty members aged 21 to 66 responded (response rate 51%). Because of item-missing the analytical sample was reduced to 297 and 208 cases in each respective regression analysis and between 279 and 309 cases in the ANOVA analyses. There was little item-missing on most variables and imputation to replace item-missing scores was not considered necessary.

The demographic composition of gender and level of injury resembles data from the Norwegian SCI registry, but the youngest age group (up to 30) is somewhat underrepresented.

Variable description

Dependent variables

The first dependent variable measures whether (1) or not (0) the person worked after SCI. The second measures whether (1) or not (0) the person was employed at the time of the interview (if employed after SCI).

Independent variables

Age at the time of interview and age at the onset of SCI were measured as continuous variables. Gender was coded as men (0) and women (1). Whether the person could continue in employment in the same job with the same employer after a SCI was coded as a set of two binary variables; "yes, able to continue in employment" and "not working or no information about employment before SCI," with "not able to continue working in the organisation" as the reference category. One variable measured tetraplegia (0) compared with paraplegia (1), and another whether the degree of injury was incomplete (0) or complete (1). Vocational rehabilitation was coded as a set of two binary variables; "no rehabilitation" and "vocational rehabilitation received," with "no vocational rehabilitation" as the reference category. Occupational class at the onset of SCI was measured using the European Socioeconomic Classification (ESeC) and

coded[2] as a set of dummies. ESeC is a valid instrument for measuring occupational class and has been widely used to study social mobility and class-related phenomena, including health inequalities (Rose, Harrison & Pevalin 2010). We chose to combine a few respondents whose occupational code was missing (of which the majority were apprentices) with individuals who were not employed before the onset of SCI. This category was chosen as the reference category. The variable years of education was recoded as a set of binary variables. Primary education or fewer years of schooling and secondary education completed were coded as two binary variables with tertiary education as reference category.

Scales measuring attitudes regarding work, quality of life, health and pain suffering

In the second part of our analysis, we study the mean differences between the three groups on a set of scales that measure job motivation and employer discrimination of wheelchair users, quality-of-life measures, work ability ("health too poor to work"), health satisfaction, and pain suffering the last seven days. Appendix 1 displays statements that the respondents assessed on 5-point scales. One scale ranged from "strongly disagree" to "strongly agree" for attitudes regarding work and whether people in wheelchairs are discriminated against. Other scales ranged from "very good" to "very bad" concerning the quality of life generally and from "very dissatisfied" to "very satisfied" regarding satisfaction with health and the ability to carry out daily activities. An 11-point scale ranged from "no pain at all" to "worst pain I can imagine."

Statistical analysis

We identify three groups based on their employment histories. The first has never been employed after SCI. The second was employed after SCI but not at the time of interview. The third was still employed at the time of the interview. Because the dependent variables were dichotomous, binary logistic regression was chosen as the regression technique. Our hypotheses two and three assume a linear association between employment and age and age at SCI, but we also tested whether there was a curve-linear association by adding squared polynomials. We have chosen to estimate regression models for men and women separately, in addition to a total sample analysis, because there has been a lack of studies with an explicit focus on gender differences in employment among those with a SCI (Valtonen, Karlsson, Alaranta & Viikari Juntara 2006). Hypothesis ten, claiming factors associated with employment could be different for men and women, was tested with interaction terms between each respective factor and gender in the total sample analysis. We first estimated a full model that included all the independent variables. Thereafter we estimate a second model that excludes the variables that were statistically non-significant in the first model. In the regression results we noticed that the strength of the adjusted odds ratios increased rather than decreased when more independent variables were included in the model, but this is not unusual for non-linear regression models, such as binary logistic regression (Mood 2010). Instead of choosing between the full model or the reduced model, we have chosen to present both. Because of small sample sizes and the risk of Type II errors, we chose to keep variables in the second model for which the p-value was very close to statistical significance at the 5% significance level. We concentrate our substantial interpretation on the second models.

The mean differences between the three employment status groups was analysed with Analysis of Variance (ANOVA), supplemented with Scheffe's post-hoc tests of pair-wise mean differences among the three groups; the 95% confidence intervals of the means are presented in **Table 4**. The scales are listed so the first seven relate to work, and the last four to quality of life, health satisfaction, ability to carry out daily activities and pain suffering. The scales are at the ordinal measurement level, but we treat them as interval measurement level variables. We nevertheless replicated this analysis with the non-parametric Kruskal-Wallis test for ranked mean differences for ordinal measurement level variables to see if we obtained similar results. The data were not weighted. SPSS IBM version 21 was used in all analyses.

Results

More than two thirds (69.5%) were employed after SCI, and 44.5% were still employed at the time of interview. **Table 1** presents descriptive statistics for the variables included in the regression analysis. The never employed were on average less educated, older and injured later than those employed.

Factors associated with return to employment after SCI

In the first regression analysis, we tested which factors were associated with who was employed after rehabilitation, irrespective of whether or not the individual had been employed before the SCI. The results for men, women and the total sample can be seen in **Table 2**.

For all models, we also tested whether there was a curve-linear association between the dependent variable and age and age at the onset of SCI, respectively. In the first regression analysis, neither of the associations were curve-linear.

Among both men and women, the following three variables were statistically significant: age at spinal cord injury, ability to continue in the same organisation, and educational level. The coefficients, however, were substantially

[2] The ESeC coding was performed by two researchers independently of one another based on relevant information about each respondent's job title and employment situation.

Table 1: Descriptive statistics for all independent variables by employment category. Mean (SD) or percentages.

	Min	Max	Total	Never worked	Continued	Employed	*p*-value
Gender (women = 1)	0	1	33.0	30.3	37.5	32.4	0.615
Age at time of interview	21	66	49.5(11.6)	52.0(11.9)	48.8(13.0)	48.2(10.3)	0.045
Age at time of spinal cord injury	0	65	29.5(14.4)	35.9(16.1)	25.5(11.1)	27.3(13.3)	<0.001
Paraplegia	0	1	65.0	55.1	72.2	67.7	0.051
Complete injury	0	1	51.9	56.2	50.0	50.0	0.621
Received vocational rehabilitation or not							0.327
No vocational rehabilitation (reference)			56.2	62.9	52.8	53.7	
No rehabilitation	0	1	5.4	6.7	2.8	5.9	
Vocational rehabilitation received	0	1	38.4	30.3	44.4	40.4	
Able or not to continue working in same organisation							<0.001
Not able to continue same organisation (reference)			39.4	56.2	43.0	26.5	
Not working or item-missing	0	1	32.0	33.7	31.9	30.9	
Able to continue working in same organisation	0	1	28.6	10.1	25.0	42.7	
Highest achieved educational level							<0.001
Primary education (reference)			42.0	65.2	38.9	28.7	
Secondary education	0	1	32.3	28.1	34.7	33.8	
Tertiary education	0	1	25.6	6.7	26.4	37.5	
European Socioeconomic Classification							0.068
Not employed before spinal cord injury (reference)			37.0	38.2	38.9	35.3	
Upper professionals, managers and self-employed	0	1	8.4	5.6	4.2	12.5	
Lower professionals and managers	0	1	16.5	11.2	12.5	22.1	
Upper and lower routine non-manual workers	0	1	6.7	6.7	6.9	6.7	
Foremen and technicians	0	1	7.0	7.9	5.6	7.4	
Skilled workers	0	1	3.4	4.5	1.4	3.7	
Semi- and unskilled workers	0	1	18.5	24.7	20.8	13.2	
N			297	89	72	136	

Note: All ANOVA and chi-square tests were done with the total sample size N = 297.

stronger in the regression analysis for men, and whether they received vocational rehabilitation and had paraplegia was also statistically significant among men. Tertiary education stands out as being the most important factor among both men and women, and among men the ability to continue working in the same organisation is also strongly associated with return to employment after SCI. In the total sample model we did not see a difference in employment between men and women after controlling for all other factors, and no gender interactions were statistically significant.

Factors associated with continued employment after return to work from SCI

The results from our second regression analysis are shown in **Table 3**. In this regression, we studied who were still employed at the time of interview, but only among those who had work experience after SCI. We included the same independent variables in this regression, and again we tested for curve-linear associations. Among women, none of the independent variables were statistically significant; therefore, we do not present any results for the female sample. Among men, age had a statistically significant curve-linear association with the dependent variable, and the opportunity to work in the same organisation after rehabilitation appeared to have a lasting impact on employment among men.

Table 2: Logistic regression of working or not working after rehabilitation. Odds ratios.

	Men (N = 199)				Women (N = 98)			
	Model 1		Model 2		Model 1		Model 2	
	OR	*p*	OR	*p*	OR	*p*	OR	*p*
Gender (women = 1)								
Age at time of interview	1.04(0.99–1.09)	0.095			0.98(0.93–1.04)	0.609		
Age at time of spinal cord injury	0.87(0.83–0.92)	<0.001	0.91(0.88–0.94)	<0.001	0.93(0.88–0.99)	0.021	0.94(0.90–0.98)	0.005
Paraplegia	2.52(1.05–6.03)	0.037	2.44(1.06–5.62)	0.035	0.73(0.18–2.85)	0.651		
Complete injury	0.79(0.30–2.03)	0.630			0.61(0.18–2.06)	0.433		
Received vocational rehabilitation		0.017		0.054		0.851		
No vocational rehabilitation (reference)	1.00		1.00		1.00			
No rehabilitation	0.25(0.02–3.16)	0.286	0.38(0.03–4.25)	0.439	0.73(0.07–7.70)	0.798		
Vocational rehabilitation received	3.18(1.24–8.16)	0.016	2.52(1.05–6.08)	0.038	1.35(0.34–5.38)	0.663		
Continue working in same organisation		0.001		<0.001		0.022		0.053
Not able (reference)	1.00		1.00		1.00		1.00	
Not working or item-missing	1.12(0.15–8.10)	0.904	0.59(0.22–1.56)	0.295	0.42(0.035–5.23)	0.506	0.88(0.26–3.04)	0.852
Able to continue working	17.44(4.01–75.82)	<0.001	16.34(4.33–61.57)	<0.001	1.35(0.34–5.38)	0.663	5.09(1.23–21.00)	0.024
Highest achieved educational level		0.001		<0.001		0.033		0.055
Primary education (reference)	1.00		1.00		1.00		1.00	
Secondary education	3.32(1.28–8.56)	0.013	3.56(1.49–8.49)	0.004	1.60(0.38–6.65)	0.514	1.84(0.58–5.82)	0.300
Tertiary education	41.28(4.78–356.50)	0.001	35.57(5.07–249.14)	<0.001	8.05(1.67–38.73)	0.009	5.37(1.35–21.28)	0.017
European Socioeconomic Classification		0.607				0.202		
Not employed before SCI (reference)	1.00				1.00			
Upper professionals, managers and self-employed	7.02(0.54–91.43)	0.137			[a]			
Lower professionals and managers	3.44(0.28–42.29)	0.334			0.031(0.01–7.27)	0.468		
Upper/lower routine non-man. workers	6.49(0.46–91.61)	0.166			1.95(0.07–55.13)	0.693		
Foremen and technicians	2.35(0.24–22.60)	0.459			[b]			
Skilled workers	8.82(0.33–234.67)	0.193			0.89(0.04–17.12)	0.940		
Semi- and unskilled workers	1.61(0.22–11.87)	0.636			0.09(0.00–1.86)	0.121		
	−2LL = 142.01 HL-test: $p = 0.959$		−2LL = 149.53 HL-test: $p = 0.789$		−2LL = 85.10 HL-test: $p = 0.404$		−2LL = 94.32 HL-test: $p = 0.142$	

Notes: All statistical hypothesis tests are Wald tests. [a] In model 1 for women no cases scored 1 on the dependent variable among upper professionals, managers and self-employed. For that particular model this category was merged with the category "Lower professionals and managers". [b] In the female sample there were no foremen or technicians.

(contd.)

(Table 2 continued)

	Total (N = 297)			
	Model 1		Model 2	
	OR	*p*	OR	*p*
Gender (women = 1)	0.79(0.36–1.72)	0.564		
Age at time of interview	1.01(0.98–1.04)	0.429		
Age at time of spinal cord injury	0.90(0.87–0.94)	<0.001	0.92(0.90–0.95)	<0.001
Paraplegia	1.51(0.77–2.96)	0.224		
Complete injury	0.94(0.48–1.83)	0.872		
Received vocational rehabilitation or not		0.022		0.038
No vocational rehabilitation (reference)	1.00		1.00	
No rehabilitation	0.31(0.06–1.53)	0.152	0.48(0.11–2.07)	0.331
Vocational rehabilitation received	2.13(1.03–4.40)	0.040	2.06(1.04–4.06)	0.037
Able or not to continue working in same organisation		<0.001		<0.001
Not able to continue same organisation (reference)	1.00		1.00	
Not working or item-missing	0.54(0.11–2.50)	0.434	0.67(0.31–1.41)	0.296
Able to continue working in same organisation	11.54(4.08–32.64)	<0.001	10.50(4.08–27.02)	<0.001
Highest achieved educational level		<0.001		<0.001
Primary education (reference)	1.00		1.00	
Secondary education	2.40(1.17–4.90)	0.016	2.69(1.37–5.26)	0.004
Tertiary education	14.13(4.37–46.80)	<0.001	13.48(4.51–40.33)	<0.001
European Socioeconomic Classification		0.217		
Not employed before spinal cord injury (reference)	1.00			
Upper professionals, managers and self-employed	2.20(0.26–18.39)	0.467		
Lower professionals and managers	0.80(0.12–5.28)	0.823		
Upper and lower routine non-manual workers	2.76(0.37–20.27)	0.318		
Foremen and technicians	0.77(0.11–5.02)	0.785		
Skilled workers	2.22(0.29–16.89)	0.440		
Semi- and unskilled workers	0.48(0.09–2.38)	0.370		
	−2LL = 241.11 HL-test: $p = 0.305$		−2LL = 252.64 HL-test: $p = 0.078$	

The same variables were also significant in the total sample model but with weaker coefficients. This was as expected when no coefficients were significant in the female sample.

The curve-linear association between age and the second dependent variable is shown in **Figure 1**. The Y-axis presents predicted probabilities of being employed, with one line for men and another for the total sample. The figure shows that employment is predicted to be the highest around 46 years of age among men, with an employment level matching that in the general Norwegian male population. For the total sample the maximum is lower, reflecting that women with SCI did not have a similar curve-linear association between continuing to work and age. Again, there was not a gender difference in the total sample model after control for all other factors and no significant interactions.

Attitudes to employment, quality of life, ability to carry out daily activities, health and pain suffering

The relative difference between the three groups on all 11 scales can be seen in **Figure 2**. The exact statistics are presented in **Table 4**. All but two scales were statistically significant when testing the mean difference between the three groups by way of ANOVA (**Table 4**). We found no significant differences in their views regarding employer discrimination against wheelchair users and health satisfaction. The Kruskal-Wallis test produced similar results. We performed Scheffe's post-hoc tests that compared two and two groups on each scale. At the 5% significance level, the first two groups differed only on the statement "Jobs I can do don't pay enough to be worthwhile." The second and third groups differed on the first six scales, which all measured attitudes regarding work, but none of the other five scales at the 5% significance level.

Table 3: Logistic regression of working or not working at the time of interview if ever worked after rehabilitation. Odds ratios.

	Men (N = 137)				Total (N = 208)			
	Model 1		Model 2		Model 1		Model 2	
	OR	*p*	OR	*p*	OR	*p*	OR	*p*
Gender (women = 1)					0.91(0.43–1.90)	0.806		
Age at time of interview	1.74(1.22–2.47)	0.002	1.56(1.14–2.15)	0.005	1.52(1.20–1.93)	<0.001	1.39(1.14–1.71)	0.001
Age at time of interview squared	0.99(0.99–0.99)	0.001	0.99(0.99–0.99)	0.003	0.99(0.99–0.99)	<0.001	0.99(0.99–0.99)	0.001
Age at time of spinal cord injury	1.00(0.94–1.05)	0.929			1.00(0.96–1.04)	0.857		
Paraplegia	1.37(0.51–3.65)	0.521			0.76(0.37–1.57)	0.464		
Complete injury	1.61(0.64–4.07)	0.308			1.11(0.56–2.18)	0.758		
Received vocational rehabilitation or not		0.489				0.356		
No vocational rehabilitation (reference)	1.00				1.00			
No rehabilitation	0.22(0.02–2.61)	0.234			3.09(0.51–18.44)	0.215		
Vocational rehabilitation received	0.91(0.33–2.46)	0.858			1.41(0.67–2.97)	0.356		
Able or not to continue working in same organisation		0.068		0.002		0.058		0.003
Not able to continue same organisation (reference)	1.00		1.00		1.00		1.00	
Not working or item-missing	0.71(0.07–6.91)	0.775	1.55(0.61–3.91)	0.352	1.41(0.31–6.30)	0.651	1.68(0.81–3.48)	0.160
Able to continue working in same organisation	4.50(1.24–16.25)	0.022	6.21(2.22–17.41)	0.002	3.26(1.21–8.76)	0.019	3.96(1.79–8.80)	0.001
Highest achieved educational level		0.220				0.580		
Primary education (reference)	1.00				1.00			
Secondary education	2.43(0.87–6.71)	0.087			1.32(0.60–2.90)	0.479		
Tertiary education	1.78(0.55–5.76)	0.333			1.52(0.66–3.50)	0.319		
European Socioeconomic Classification		0.166				0.256		
Not employed before spinal cord injury (reference)	1.00				1.00			
Upper professionals, managers and self-employed	0.82(0.04–13.74)	0.892			2.44(0.28–21.21)	0.418		
Lower professionals and managers	1.05(0.07–15.60)	0.971			1.32(0.21–8.38)	0.763		
Upper and lower routine non-manual workers	0.16(0.01–2.67)	0.204			0.88(0.12–6.36)	0.900		
Foremen and technicians	0.73(0.06–9.11)	0.812			1.49(0.22–9.71)	0.676		
Skilled workers	0.03(0.00–0.92)	0.044			0.25(0.03–1.70)	0.157		
Semi- and unskilled workers	0.32(0.03–3.28)	0.343			0.60(0.12–3.03)	0.539		
	−2LL = 136.33 HL-test: $p = 0.091$		−2LL = 151.57 HL-test: $p = 0.536$		−2LL = 232.59 HL-test: $p = 0.899$		−2LL = 246.24 HL-test: $p = 0.260$	

Note: All statistical hypothesis tests are Wald tests.

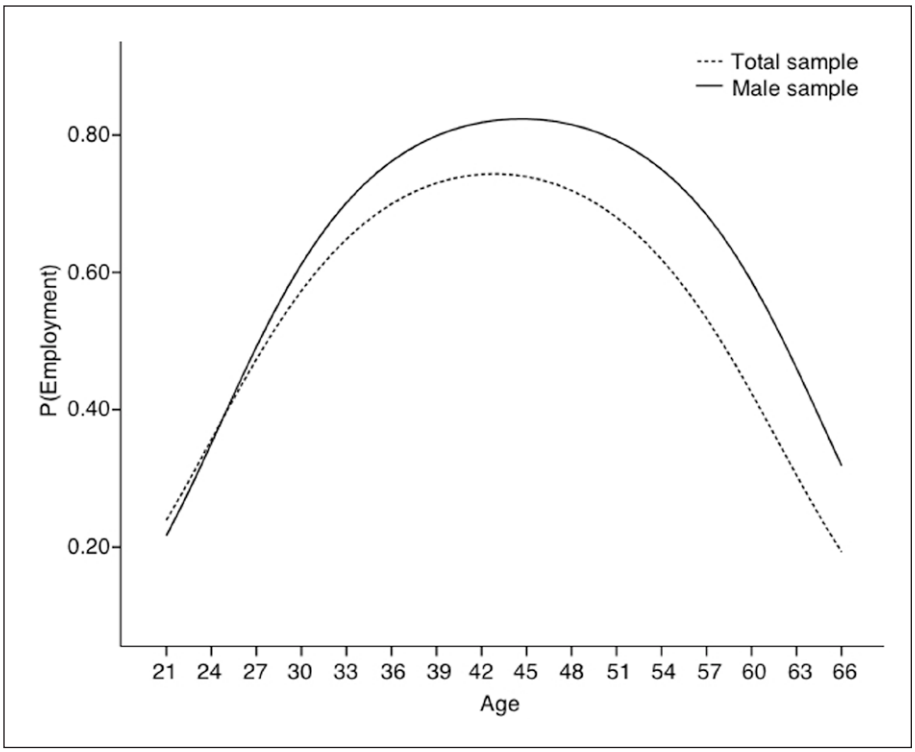

Figure 1: Predicted probabilities of employment at the time of interview by age among those who worked after rehabilitation.

The individuals with no employment experience post-injury and those still employed at the time of interview differed on all scales except two: health satisfaction and employer discrimination against wheelchair users.

The respondents' experience of pain was statistically significant across the three groups ($p < 0.001$), and the three post-hoc tests revealed that the employed were significantly different in their pain suffering from those who never returned to work after SCI ($p = 0.045$) but not from individuals who worked after SCI ($p = 0.051$). However, because the means ranged from 3.45 to 4.38 (scale 0–10), and our focus is whether pain may have affected employment among people with SCI, we nevertheless interpret this difference as substantially non-significant. The low mean scores for all three groups and the small mean difference on the 11-point scale suggests pain most likely is not a mechanism associated with past or present employment.

For the scale "My health is too poor to maintain a regular job" and five other job-related scales, the currently employed scored differently from the two groups that were not employed, suggesting both work ability and job motivation could be associated with past and present employment.

All three groups agreed slightly in favour of the statement that employers discriminate against wheelchair users in Norway, with no significant differences between the groups. This result suggests a common understanding of labour discrimination against people in wheelchairs.

For quality of life and ability to carry out daily activities, the employed reported a slightly better quality of life and ability to carry out daily activities, but only the currently employed and individuals who had never been employed were significantly different.

Discussion

Employment after spinal cord injury

Previous research on employment among people with SCI has rarely had an explicit focus on gender differences. In this study we have paid attention to the gender dimension in two ways. If H1 is supported we would expect to find no gender differences in actual employment rates. If H10 is supported, we would expect to find stronger relationships between (labour market) factors and employment for men compared to women. In line with H1, there was no difference in employment between men and women. However, despite that no interaction effects between gender and other factors were statistically significant in both regression analyses, the difference in coefficient strength among the significant factors and the larger number of significant factors among men gives a substantial if not statistically significant support for H10. We therefore conclude that our results support the idea there could be different labour market conditions for men than for women to return to employment after SCI. One explanation to this difference could be that male and female jobs are different or that the type of jobs that men and women are willing to accept after SCI tend to differ (manual versus non-manual jobs, type of industry and job demands affecting work ability), which ultimately may favour the employment opportunities for women with SCI (Schedin Leiulfsrud, Reinhardt, Ostermann, Ruoranen & Post 2014).

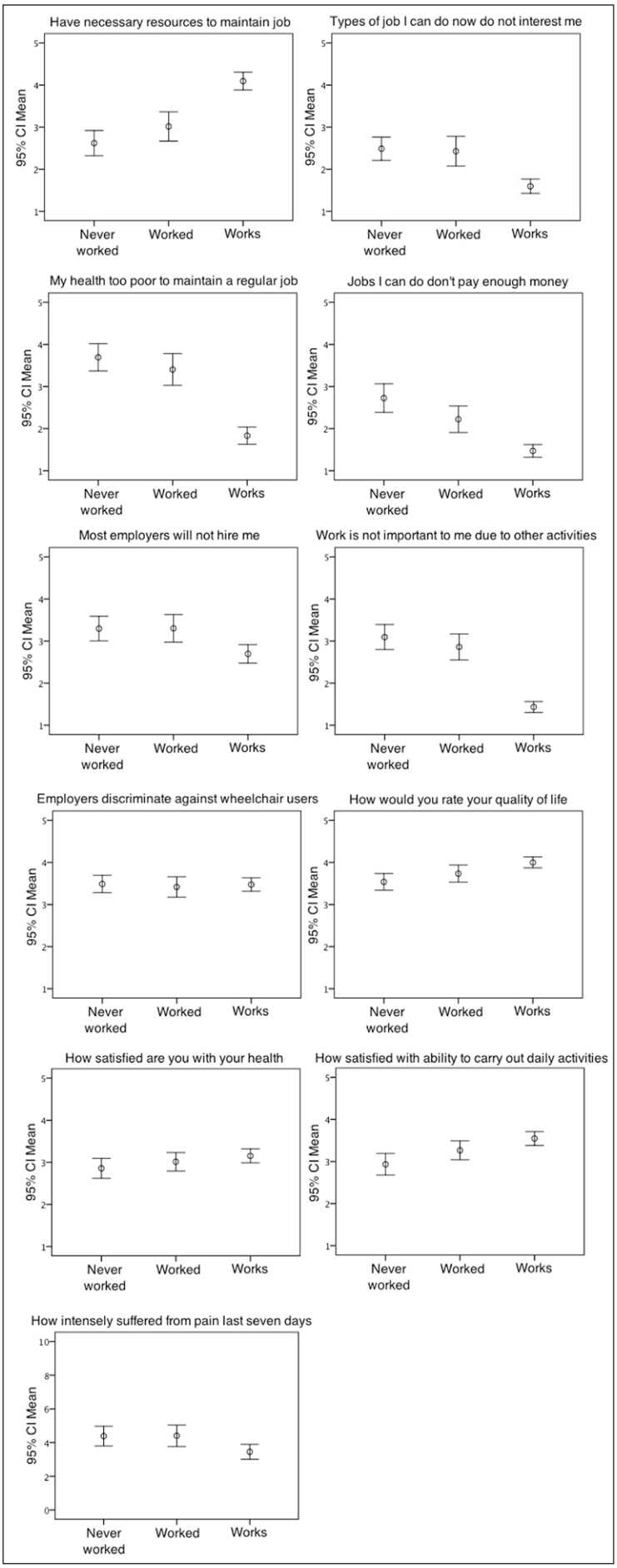

Figure 2: Mean scores with 95% confidence intervals for all 11 scales by employment status groups.

Table 4: ANOVA-analysis of job motivation, discrimination, quality of life, health and pain suffering, with means and standard deviations.

			Means with 95% CI				ANOVA	Scheffe's Post-Hoc tests			
	Min	Max	Total	Group 1	Group 2	Group 3	1vs2vs3	1vs2	2vs3	1vs3	N
1. Resources to maintain job	1	5	3.43(3.26–3.61)	2.62(2.32–2.92)	3.02(2.67–3.36)	4.09(3.89–4.30)	<0.001	0.199	<0.001	<0.001	281
2. Types of jobs not interesting	1	5	2.04(1.89–2.19)	2.49(2.21–2.76)	2.43(2.08–2.78)	1.60(1.42–1.77)	<0.001	0.957	<0.001	<0.001	279
3. Health too poor to work	1	5	2.73(2.54–2.92)	3.70(3.37–4.02)	3.41(3.03–3.79)	1.83(1.63–2.04)	<0.001	0.448	<0.001	<0.001	283
4. Jobs don't pay enough	1	5	2.00(1.85–2.15)	2.73(2.39–3.06)	2.22(1.91–2.54)	1.47(1.32–1.62)	<0.001	0.043	<0.001	<0.001	279
5. Employers will not hire me	1	5	3.01(2.85–3.16)	3.30(3.00–3.59)	3.30(2.97–3.63)	2.70(2.48–2.92)	0.001	1.000	<0.010	<0.005	279
6. Work is not important to me	1	5	2.25(2.09–2.40)	3.10(2.80–3.39)	2.86(2.55–3.17)	1.43(1.31–1.56)	<0.001	0.429	<0.001	<0.001	285
7. Employers discriminate	1	5	3.46(3.35–3.58)	3.49(3.28–3.70)	3.42(3.18–3.66)	3.47(3.31–3.63)	0.886				306
8. Quality of life	1	5	3.79(3.70–3.89)	3.54(3.34–3.74)	3.73(3.53–3.94)	4.00(3.87–4.13)	<0.001	0.335	0.092	<0.001	307
9. Satisfied with health	1	5	3.03(2.91–3.15)	2.86(2.62–3.09)	3.01(2.79–3.23)	3.15(2.99–3.32)	0.104				307
10. Carry out activities	1	5	3.29(3.17–3.41)	2.93(2.68–3.19)	3.27(3.04–3.49)	3.55(3.38–3.71)	<0.001	0.130	0.175	<0.001	305
11. Suffered from pain	0	10	3.97(3.66–4.28)	4.38(3.80–4.97)	4.41(3.76–5.05)	3.45(3.01–3.90)	0.013	0.999	0.051	0.045	309

Note: Group 1 represent those who never worked after SCI. Group 2 are those who returned to work but do not work at the time of interview. Group 3 are those who are still working at the time of interview.

Age was not a predictor of returning to employment after SCI but a predictor of continuing to stay in employment, with a peak at age 46. The low predicted probability among the youngest (men) to remain in employment was an unexpected result, because it shows that *among those who worked after a SCI, the youngest were more likely than the middle aged to have dropped out*. This result goes against our theoretical expectation that employment or staying in employment after SCI only decreases with age (H2). The relative advantage of middle-aged men in their employment prospects could be explained by the fact that most of them are already well established in the labour market with relevant human capital and could have additional support from a spouse and children. Younger men may have trouble overcoming the barrier of entering the labour market or holding on to a job because they lack work experience or have no partner. Contrary to official goals, Norwegian authorities appear to be more concerned about reducing absences because of illness than taking active measures to recruit people with disabilities (Svanlund & Hansen 2013). In contrast, the public welfare system may have given up too early and given young people with SCI disability pensions, with few incentives for employment (Anvik 2006).

Age at time of SCI showed the opposite result, as it was significant for employment after SCI but not to remain in employment until the time of interview. The higher the age at onset of SCI, the less likely he or she was to return to employment, which supports H3. This result supports that injury at a young age or in early adolescence could increase the chances of employment, for example by choosing education or an occupation that increases the young adult's employment opportunities (Lidal, Huyhn & Biering-Sørensen 2007; Lidal, Hjeltnes, Røislien, Stanghelle & Biering-Sørensen 2009; Ottomanelli & Lind 2009).

Only among men did we find support for H4. Men with paraplegia are more likely to be employed than men with tetraplegia. We found no support for H5, assuming persons with a complete injury were less likely of being employed.

The Norwegian labour market is still highly gender segregated, and as more women than men have obtained higher education over the last two decades, there is also a notable and increasing difference in tertiary education between men and women (Jensberg, Mandal & Solheim 2012). Tertiary education was strongly associated with employment after an SCI among both men and women, and having secondary education was also an advantage among men but not women. This result supports H8 and is in line with the SCI literature (Krause & Reed 2009; Krause, Saunders & Acuna 2012). However, staying in employment after SCI until the time of interview was not associated with education. Hence, education is important to gain a job after SCI, but not for continuing to work having passed the first barrier.

Among men but not women we found a positive relationship between employment and vocational rehabilitation (H6) and employment and ability to continue working in the same organisation as before the SCI (H7). These are important and policy-relevant gender differences. Is there a need for more or better vocational rehabilitation for men than women post-SCI? Are organisations that have male-dominated workplaces less willing to change the job demands or facilitate employment for employees with significantly reduced work ability?

Contrary to previous research (Ferdiana et al. 2014) and our expectations (H9) this study did not lend support to an occupational class gradient. However, among men, relative to the reference category "not employed before SCI," the upper professionals/managers/self-employed, upper and lower routine non-manual workers, and skilled workers all had higher odds ratios than lower professionals/managers, foremen/technicians and semi- and unskilled workers. We also noticed a ranked order among the last three occupational classes. Even if the occupational classes did not differ in terms of statistical significance, the results suggest a substantial gap between non-manual workers, skilled workers and upper professionals/managers/self-employed and the other three classes. This result could be interpreted as a tendency towards partial support for H9 among men, but more research with larger samples would be needed to confirm such support.

Perception of work and quality of life

The study revealed distinctive differences in the perceptions of work between the employed and the non-employed. The ANOVA post-hoc results suggest that "health too poor to work" but not pain suffering could have affected past employment. Those still at work were also different from those who never worked after SCI in their ability to carry out daily activities, which could be interpreted as those still working cope better in general. Satisfaction with one's own health did not differ among the groups. This is important, because it suggests that the result for "health is too poor to work" could be related to job demands and the type of work for which the person is qualified. Alternatively, these results could point to comorbidity, where those who are not employed have other health problems in addition to SCI that reduces their work ability but not necessarily their overall health satisfaction.

The statements "resources to maintain a job," "types of job not interesting" and "work is not important to me" were scored significantly higher and "employers will not hire me" significantly lower among those still employed, while employer discrimination was not different between the three groups. These results suggest job motivation is higher among the employed; they think they have better resources to maintain a job and that employers are more likely to recruit them. Furthermore, "jobs don't pay enough" was also different between the three groups, supporting the idea earnings could have played a motivating factor for returning to or staying in work, with the better earners being more motivated. However, we do not know whether these conditions and attitudes have changed over time, such as job motivation dropping after failing to return to work, but they certainly reflect a difference where the employed

could be more likely than the non-employed to continue working due to better job motivation or resources. Moreover, these results could point to the importance of keeping the non-employed motivated if they are to return to work and help to facilitate resources the person may feel he or she is lacking to maintain a job. If not, non-employment could become an irreversible process, where prolonged non-employment leads to insufficient job motivation and the belief a job cannot be maintained unless a person with SCI receives more resources. Future research, including those evaluating the effects of interventions, should therefore explore what resources or skills are crucial to maintain a job and how to keep the non-employed motivated.

Study limitations

Our data comprise members of the Norwegian Spinal Cord Association LARS and may not be representative for all people with SCI in Norway. We also did not include individuals with an additional brain injury in our study population. The response rate was only 51%, but the diagnosis, gender distribution and proportion that were employed in our data were very similar to the statistics found in Lidal's 2009 study and in the SCI registry for Norway (Halvorsen and Pettersen 2014). The sample sizes were relatively small, particularly among women but also men (e.g. the lack of statistical significance for the occupational class gradient), and could have led to Type II errors when we did statistical hypothesis testing. The study design could also have been better, asking the exact year when the person started and ended working, and to what extent health, pain suffering, job motivation and discrimination affected his or her work ability or job chances in the past.

Conclusion

The most important results for employment after SCI were to have secondary or (in particular) tertiary education, the possibility to continue working in the same organisation as before SCI, vocational rehabilitation, and age at onset of SCI. These factors were stronger among men than among women. When comparing those still in employment versus those who had succeeded working after SCI but were no longer working, only age and continuing to work in the same organisation were significant factors, among men. Hence, the factors we studied seem more crucial for understanding return to work after SCI than continuing to stay in employment if employed after SCI, and more so among men than women. Despite these gender differences in the relative impact of each factor we saw no gender differences in employment.

The three groups (never worked after SCI, worked after SCI but not at the time of the interview, worked after SCI and still employed) differed systematically on most scales that measured job motivation, quality of life and the ability to conduct daily activities, except health satisfaction and discrimination by employers against wheelchair users. Pain suffering varied little among the groups. These results suggest that health and job motivation could also be associated with employment after SCI, and those who remain in employment report a somewhat better quality of life.

Our study revealed results highly relevant for policymaking. Future research should document whether these results are specific to the Norwegian context.

Additional Files

The additional files for this article can be found as follows:

- **Appendix 1.** Questions referring to Table 4. DOI: https://doi.org/10.16993/sjdr.322.s1
- **Appendix 2.** Estimated unadjusted odds ratios for each independent variable. DOI: https://doi.org/10.16993/sjdr.322.s2

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Competing Interests

The authors have no competing interests to declare.

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