

Work intensity and variations in health and personal characteristics of individuals with Spinal Cord Injury (SCI)

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Abstract. The purpose of this study is to describe the relationship between work intensity, personal and injury-related factors and the resources typically associated with employment, including insurance, access to health care, and salary. Retrospective analysis is performed on cross-sectional data from 436 individuals between the ages of 18 and 64 years old that participated in the quantitative component of a larger project examining the needs of Virginians with SCI. No significant differences are found with regard to gender or pre-injury employment status between individuals with SCI who are not working, those employed part time (<30 hours per week), and those employed full-time (>30 hours per week). Significant differences are noted between groups with regard to race, marital status, total number of medical problems, receipt of vocational services, and severity of injury. In addition, individuals who are employed either part-time or full-time are more likely to have health insurance ($p = 0.034$) than those not working for pay. Individuals working full-time are significantly more likely to have dental insurance ($p < 0.001$), less likely to have been unable to get needed medical care ($p = 0.025$), and less likely to have problems with either uncontrolled spasticity ($p < 0.001$) or chronic pain ($p < 0.001$) in the past 12 months as compared with the other two groups. Results support the value of employment in providing access to health care and a range of other benefits for persons with a SCI. Part-time employment provided significant advantages over unemployment status however individuals who spent at least 30 hours a week in paid employment had the highest levels of resources. Our findings also suggest, though, that secondary conditions may influence the level/intensity of employment for individuals with SCI and that working part-time still provides advantages over unemployment.

Keywords: Work intensity, spinal cord injury, employment

1. Introduction

Employment is a complex issue affected by personal, systemic, environmental, and economic factors. For individuals with SCI, the barriers to gaining and sustaining employment appear magnified while the support available appears insufficient. Specific correlates

and predictors of employment and unemployment for individuals with SCI have been well researched, however part-time employment has received less attention. This paper examines the correlates of part-time employment, as compared with unemployment and full-time employment, for individuals with SCI.

2. Background

Individuals with SCI have high rates of unemployment and under-employment. In the United States, the employment rates for persons with SCI range from 13%

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to 69% [1,4–6,13,17,21,24]. The variability in these figures can be explained by differences in the definition of employment (e.g., whether or not it is limited to paid employment or includes other productive activities such as homemaking or student), the time period assessed, and the population examined. Overall, between 35% and 56% were employed at some point after their injury [10,21,24], though this percentage increases to 95% for those with a college education.

In general, the likelihood of employment has been shown to increase with time post injury [17,20,23]. Injury related factors, though, are inconsistent in their predictive power. While some studies have found that level of injury is a strong predictor of return to work [7, 9] with less severe injuries associated with greater employment rates [23], other studies do not support this view [10,16,22]. Similarly, one investigation found completeness of the injury, in terms of paraplegia and tetraplegia, is a predictor of return to work [2] while others do not [10,17].

Examining functional limitations, rather than injury itself, may provide more consistent information. For example, one study found that ability to negotiate transportation independently was predictive of employment [15]. Another study noted that individuals who are employed report that functional limitations affect them in terms of mobility both within the workplace and in getting to and from work [8]. For persons with SCI, barriers to returning to work are created by physical limitations, which prevent full participation and independence at the work site, causing declines in life satisfaction and the need to work part-time [13].

Employment following SCI also may depend on type of job, education, and pre-injury work status. While there is no consistent relationship identified between pre- and post-injury employment status [23], employment at the time of injury is associated with lower mean times in return to work programs [10] and a greater probability of post-injury employment [23]. In addition, while occupations of persons with SCI range through many employment categories prior to injury, common occupations after injury included clerical, office, administrative, professional, and technical jobs [2, 8,10] rather than occupations involving heavy manual labor [23]. Those who returned to work involving the same level of physical intensity as pre-injury tended to work part-time [13].

It has been suggested that difficulties in physical adjustment and lack of stamina resulting from SCI do not allow some individuals to meet the demands of full-time work [26]. While full-time employment may not

be viable for all individuals with SCI, part-time employment may be a more reasonable option that provides some – if not all – of the benefits of full-time employment. For example, Hess and colleagues [12] looked at the relationship between work intensity and psychological outcomes. They found that individuals who were employed even part-time had significantly higher levels of social integration and fewer depressive symptoms than individuals who were unemployed and that their ratings of satisfaction were life were equivalent to individuals in full-time employment.

Part-time employment is often not optimum as it often fails to offer the compensation, benefits (including health insurance) and autonomy associated with full-time employment. However, it may provide a way of maintaining Supplemental Security Income (SSI) and Social Security Disability Insurance (SSDI) while still taking advantage of the social and self-esteem building opportunities offered by work. The specific aims of this paper were to examine how respondents differ on demographic and health-related factors based on their level of employment (unemployed, part-time, full-time) and to explore benefits associated with the differing levels of work intensity.

3. Methodology

Data were collected using the *Virginia Spinal Cord Injury (SCI) Needs Assessment Survey*. The survey was fielded in late 2004 following a period of expert review, pilot testing, and revisions. No sample was drawn; rather, a census of the known population was conducted. The population was comprised of individuals with records in the Virginia SCI Registry, maintained by Virginia's Department of Rehabilitative Services (DRS).¹ Also included were individuals who heard about the study through advertising efforts and other sources.

The survey was fielded using a modified Dillman approach. A \$3 incentive was used to facilitate participation. Attempts were made to contact non-responders via telephone, in order to minimize non-response bias.

¹We attempted to verify the contact information for individuals in the registry ($n = 3,265$) during the period in which the surveys were being developed. The result of this effort was verifying 662 records with good addresses, identifying 299 records in which the individual was deceased, identifying 532 records with bad addresses, and 107 records in which the individual either refused or was not injured. There were 1,665 records in which the individual could not be contacted.

Table 1
Age and Years since Injury

	Employment status		
	Not Employed	Part-time	Full-Time
<i>Age</i>			
Mean	44.2	44.1	42.8
Median	45.0	44.0	43.0
SD	12.5	13.0	10.2
<i>Years since Injury*</i>			
Mean	9.7	13.8	11.9
Median	8.0	11.0	11.0
SD	7.5	9.7	7.9

* $P < 0.05$.

The survey was also made available via the Internet and a toll-free number was made available so that respondents could call in and complete the survey. The survey was also available in Spanish. The survey was sent to a valid sample to 1,600. A total of 539 completed consumer surveys were received yielding a response rate of 34%.

3.1. Statistical analyses

Since this analysis was focused on employment, we limited it to the 436 respondents who were between the ages of 18 and 64 and reported work status. Descriptive statistics were used to describe the respondents' characteristics. Chi-squared analyses were conducted to determine the extent of association between demographic and health-related variables and employment. All analyses were conducted using SPSS 13.0.

4. Results

4.1. Demographics and employment

Among the 436 respondents, 58% ($n = 251$) were unemployed at the time of the survey, 34% ($n = 148$) were employed full-time (30 or more hours per week), and the remaining 8% ($n = 37$) were employed part-time (less than 30 hours per week). The mean age of respondents was 43.8 ($sd = 12.0$) and the mean years since injury was 10.8 ($sd = 7.9$). Table 1 contains age and years since injury by employment group.

As seen in Table 2, employment intensity was significantly associated with age ($p = 0.006$), years since injury ($p = 0.02$), race ($p \leq 0.001$), education ($p \leq 0.001$), and dependents living at home ($p = 0.002$). Both full-time and part-time respondents were more likely to be: between the ages of 30 and 49; at least three years post-SCI; White; and to have

higher levels of education. Part-time and unemployed respondents were less likely to have dependent children at home as compared to their full-time counterparts. Employment intensity was not significantly associated with gender ($p = 0.496$), marital status ($p = 0.061$) or pre-employment work status ($p = 0.093$).

4.2. Health indicators and employment

As seen in Table 3, respondents who were employed full-time were most likely to report their health as good to excellent (84%) followed by the part-time employed (79%) and then the unemployed (54%) ($p \leq 0.001$). Similarly, individuals who reported difficulty in accessing needed health care within the last 12 months were also more likely to be unemployed or employed part-time ($p = 0.025$).

The three most commonly occurring medical complications among all respondents were uncontrolled spasticity, chronic pain, and urinary tract infections. In all cases, those experiencing these conditions were significantly less likely to work and less likely to work full-time than their counterparts without the condition. Further, respondents who worked full-time were likely to have fewer health conditions than those who worked part-time and those who were unemployed ($p \leq 0.001$).

In terms of level of disability, those employed full-time were less likely to have a complete SCI and less likely to be a wheelchair user. Findings were similar for those with part-time employment. Respondents who were able to function independently, without help from others, were significantly more likely to report being full-time employed (78%) as compared to their part-time (57%) or unemployed (33%) counterparts. Intensity of work and level of injury were not significantly associated ($p = 0.758$).

4.3. Benefits and level of employment

As seen in Table 4, respondents who were employed full-time were much more likely to receive health benefits through work as compared to those employed part-time (74% vs. 19%). Similarly, full-time employed respondents were more likely to receive paid vacation and sick leave than those employed part-time. In the area of salary, as expected, those who reported higher salaries tended to be employed in full-time rather than part-time positions ($p \leq 0.001$).

Table 2
Demographic Characteristics of Respondents

Characteristic	Employment status			p-value*
	Not Employed	Part-Time % (n)	Full-Time % (n)	
<i>Age</i>				
18 to 29	18% (46)	14% (5)	12% (18)	0.006
30 to 39	15% (37)	24% (9)	26% (39)	
40 to 49	24% (60)	22% (8)	34% (50)	
50 to 59	32% (81)	27% (10)	24% (35)	
60 to 64	11% (27)	14% (5)	4% (6)	
<i>Years since injury</i>				
Less than three	13% (32)	0% (0)	4% (6)	0.02
Three to six	30% (72)	30% (11)	26% (37)	
Seven to nine years	13% (31)	14% (5)	13% (18)	
Ten or more years	44% (108)	57% (21)	57% (80)	
<i>Gender</i>				
Male	73% (182)	70% (26)	78% (115)	0.496
Female	27% (67)	30% (11)	22% (33)	
<i>Race</i>				
White	63% (157)	78% (29)	82% (122)	0.000
Non-White	38% (94)	22% (8)	18% (26)	
<i>Education</i>				
Less than high school	26% (65)	11% (4)	4% (6)	0.000
High school diploma	33% (81)	30% (11)	32% (46)	
Some college or college graduate	41% (102)	60% (22)	64% (94)	
<i>Children under 18 at home?</i>				
Yes	20% (49)	19% (7)	35% (52)	0.061
No	80% (201)	81% (30)	65% (96)	
<i>Marital Status</i>				
Married or Partnered	39% (96)	49% (18)	54% (80)	0.061
Single	38% (93)	35% (13)	30% (44)	
Other	23% (57)	16% (6)	16% (24)	
<i>Employed Prior to SCI</i>				
Yes	77% (193)	81% (29)	86% (125)	0.093
No	23% (57)	19% (7)	14% (20)	

*Chi-squared analyses.

Column percents may be 100% +/- 1% due to rounding error.

5. Discussion

Poor health and stamina, ongoing health problems and loss of benefits are among the most frequent reasons given for unemployment among individuals with SCI [26]. This study provides evidence to negate some of those fears and support the position that while full-time employment offers clear benefits, part-time employment may provide a beneficial alternative to individuals who might otherwise remain unemployed.

Part-time employment appears to be an option chosen by relatively few individuals with SCI [12]. In this study, only 8% of respondents were employed less than 30 hours a week while the majority were unemployed (58%) and a significant percentage worked full time (30 or more hours a week; 34%). Similar to results of previous studies [6,12,21,24,27], employment was associated with current age, years since injury, race, and education. Both full-time and part-time employed

respondents were more likely to be between the ages of 30 and 49, more likely to be at least three years post-SCI, more likely to be White, and were more likely to have higher levels of education. An interesting addition to the literature is that part-time and unemployed respondents were less likely to have dependent children at home as compared to their full-time counterparts. Employment intensity was not associated with gender, marital status, or pre-employment work status.

Despite concerns and fears to the contrary, individuals who were employed either part time or full-time were more likely to have health insurance than those who were not employed. Of course, the source of insurance differed between groups with those in full-time employment significantly more likely to receive insurance through their job. Ability to access medical care also differed with work intensity level. Individuals with SCI who were unemployed were most likely to report that there was a time in the past 12 months when they

Table 3
Summary of Health Status and Full-Time vs. Part-Time Status

	Employment Status			p-value*
	Not Employed % (n)	Part-Time % (n)	Full-Time % (n)	
<i>Perceived Health</i>				
Good to excellent	54% (129)	79% (27)	84% (121)	0.000
Poor to Fair	47% (112)	21% (7)	16% (23)	
<i>Have Health Insurance</i>				
Yes	80% (193)	89% (31)	90% (130)	0.034
No	20% (48)	11% (4)	10% (15)	
<i>Have Dental Insurance</i>				
Yes	30% (66)	38% (13)	69% (98)	0.000
No	70% (157)	62% (21)	32% (45)	
<i>Number of Medical Complications/Secondary Conditions</i>				
None	11% (28)	19% (7)	33% (49)	0.000
One to three	46% (116)	46% (17)	48% (71)	
More than three	43% (107)	35% (13)	19% (28)	
<i>Uncontrolled Spasticity within Past 12 Months</i>				
Yes	47% (119)	41% (15)	20% (30)	0.000
No	53% (132)	60% (22)	80% (118)	
<i>Urinary Tract Infections within Past 12 Months</i>				
Yes	46% (116)	35% (13)	30% (44)	0.004
No	54% (135)	65% (24)	70% (104)	
<i>Chronic Pain within Past 12 Months</i>				
Yes	45% (113)	46% (17)	25% (37)	0.000
No	55% (138)	54% (20)	75% (111)	
<i>Unable to access medical care within past 12 months</i>				
Yes	23% (55)	18% (6)	12% (17)	0.025
No	77% (185)	82% (28)	88% (127)	
<i>Completeness of Injury</i>				
Complete	28% (67)	19% (7)	13% (18)	0.002
Incomplete	72% (174)	81% (30)	88% (126)	
<i>Wheelchair User</i>				
Yes	68% (158)	47% (16)	49% (67)	0.000
No	32% (73)	53% (18)	51% (71)	
<i>Level of Injury</i>				
Paraplegia	46% (92)	48% (15)	42% (50)	0.758
Tetraplegia	54% (108)	52% (16)	58% (68)	
<i>Help with Daily Activities</i>				
None	33% (82)	57% (21)	78% (116)	0.000
Some	67% (169)	43% (16)	22% (32)	

*Chi-squared analyses.

Column percents may be 100% +/- 1% due to rounding error.

were unable to access needed medical care (23%). This was significantly higher than the rates of inability to access care by individuals who were employed either part-time (18%) or full-time (12%). Those in full-time employment, though, were much more likely to have dental insurance than either of the other groups.

Health, including medical complications and perceived health, also differed significantly between groups in this study. The three most commonly occurring medical complications among all respondents were uncontrolled spasticity, chronic pain, and urinary tract infections. In all cases, those experiencing these conditions were significantly less likely to work and less likely to work full-time than their counterparts without

the condition. Further, respondents who worked full-time were likely to have fewer health conditions than those who worked part-time and those who were unemployed. These results appear to suggest that, in terms of medical complications at least, those employed part-time are more similar to the unemployed as opposed to individuals with SCI who are employed full-time. However, it is important to recognize that 79% of individuals employed part-time rated their health as good to excellent. This was more similar to ratings reported by respondents employed full-time (84%) than those who were not employed (54% of whom reported their health as good to excellent). This is a significant finding as perceived health has been strongly correlated with

Table 4
Work Benefits

	Employed			p-value*
	Not Employed	Part-Time % (n)	Full-Time % (n)	
<i>Salary</i>				
Less than \$20,000	n/a	78% (28)	19% (28)	0.000
\$20,000 to \$29,999	n/a	14% (5)	15% (22)	
\$30,000 to \$39,999	n/a	6% (2)	13% (19)	
\$40,000 to \$59,999	n/a	3% (1)	21% (31)	
\$60,000 or more	n/a	0% (0)	31% (45)	
<i>Receive Health Benefits through Work</i>				
Yes	n/a	19% (7)	74% (110)	0.000
No	n/a	81% (30)	26% (38)	
<i>Received Paid Vacation through Work</i>				
Yes	n/a	22% (8)	70% (104)	0.000
No	n/a	78% (29)	30% (44)	
<i>Receive Sick Leave through Work</i>				
Yes	n/a	14% (5)	60% (88)	0.000
No	n/a	87% (32)	41% (60)	

*Chi-squared analyses.

Column percents may be 100% +/- 1% due to rounding error.

morbidity and mortality [14].

In terms of level of disability, those employed full-time were less likely to have a complete SCI and less likely to be a wheelchair user than unemployed respondents, with individuals employed part-time falling somewhere in between. In addition, respondents who were able to function independently, without help from others, were significantly more likely to report being full-time employed (78%) as compared to their part-time (57%) or unemployed (33%) counterparts. However, intensity of work was not significantly associated with level of injury (paraplegia vs. tetraplegia).

As expected, the benefits associated with full-time employment were significantly greater than those associated with working less than 30 hours per week. With regard to salary, individuals who reported higher salaries tended to be employed full-time rather than part-time. Respondents who were employed full-time were much more likely to receive health benefits through work as compared to those employed part-time (74% vs. 19%). Similarly, full-time employed respondents were more like to receive paid vacation and sick leave than those employed less than 30 hours a week.

Findings from this paper should assist both individuals with SCI and vocational rehabilitation counselors to better plan the steps to employment. Part-time employment may provide either an intermediate step to working full-time or become a preferred option when secondary complications or other barriers limit the ability of the individual with SCI to maintain the more intense, and often less flexible, schedule of full-time employment [11]. In interpreting and applying the findings,

though, it is important to be aware of the limitations of the study. Survey respondents were self-selected and, because of limitations in the variable received from the registry, it is not known to what extent they reflect the population of individuals with SCI living either in Virginia or the United States. In addition, the survey did not distinguish between what supports and vocational services persons had received and which ones they were currently receiving that might assist in maintaining employment status. Finally, the cross-sectional methodology imposes limits on the conclusions that can be drawn from the analyses conducted for this study.

6. Conclusions

This study examined the relationship between work intensity, personal and injury-related factors and the resources typically associated with employment for individuals with SCI. While many of our findings related to employment are consistent with previous literature, including its value providing access to health care and a range of other benefits, our results suggest that individuals who work less than 30 hours a week for pay represent a unique population. Part-time employment provided significant advantages over unemployment and may be a reasonable option of individuals with SCI who experiencing significant functional limitations or several secondary conditions.

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