Original Research

Characteristics Associated With Perceived Underemployment Among Participants With Spinal Cord Injury

James S. Krause, PhD [a], Clara E. Dismuke-Greer, PhD [b], Karla Reed, MA [c]

[a] *College of Health Professions, Medical University of South Carolina, Charleston, SC*
[b] *Health Economics Resource Center, VA Palo Alto, Menlo Park, CA*
[c] *Spartanburg Methodist College, Spartanburg, SC*

Abstract *Objective:* To identify job characteristics related to perceived underemployment among people with spinal cord injury (SCI), while controlling for demographic, injury, and educational factors.

Design: Cross-sectional, logistic regression with predicted probabilities of underemployment.

Setting: Medical University in the Southeastern United States.

Participants: 952 were adults with traumatic SCI, all of whom were a minimum of 1-year post-injury and employed at the time of the study. They averaged 46.7 years of age, the majority were male (70.5%), and over half (52%) were ambulatory (N=952).

Interventions: Not applicable.

Main Outcome Measure(s): Perceived underemployment was defined and measured by a dichotomous variable (yes/no).

Results: Demographic, injury, and educational factors explained only 4.8% of the variance in underemployment, whereas the full model explained 21.8%. Underemployment was significantly lower for women (odds ratio [OR]=0.66, 95% confidence interval [CI; .44, .98]), those who were either married or in a nonmarried couple (OR=0.63, 95% CI [.42, .93]), those with health benefits (OR=0.58, 95% CI [.37, .91]) and higher for those with lower earnings and occupations in the category of sales, professional/managerial. Postsecondary educational milestones, having received a promotion or recognition, and working full time were not identified as significant predictors in the multivariate model, although each was significantly related to a lower likelihood of underemployment when using a restricted model that controls only for demographics, SCI, and

educational status (rather than all variables simultaneously). Age, years since injury, and injury severity were not significant.

Conclusion: Underemployment is a concern among people with SCI and is more prevalent in low-paying jobs, without benefits, and opportunities for recognition and promotion. Vocational counseling strategies need to promote quality employment, including jobs with recognition and benefits.

Employment rates for people with spinal cord injury (SCI) lag well below those of the general population. Although rates vary between studies and as a function of participant characteristics, a recent international study identified an overall employment rate of 38%,[1] and studies focused on return to employment have found, of individuals who were competitively employed at injury, only 30%-58% end up returning to work post-injury.[2] A large body of research[3] has explored determinants of return to work after SCI but only as related to employment status (working vs not working), rather than variations in the quality of employment, such as earnings, benefits, and perceived underemployment. There is a clear need to better quantify employment outcomes for people with SCI based on job quality.

One metric of job quality is work intensity, including quantitative demands such as workload and working hours.[4] Underemployment is experienced when current work intensity does not match desired work intensity. For example, part-time workers who would prefer full-time work and highly skilled workers engaged in low-paying or low-skill employment would be considered underemployed.[5,6] Unfortunately, there is an absence of standardized measurement of underemployment and data on underemployment are *not* routinely collected as a component of widely used population data, such as the Current Population Survey. One limited study suggested that over one-third of college graduates in the United States were defined as underemployed,[7] and underemployment, specifically involuntary part-time status, has been associated with lower satisfaction in pay, promotion, and benefits.[8] However, data from the general population on underemployment are simply lacking. A recent study concluded underemployment is more likely to occur in people with disabilities and is associated with a decline in mental health.[9]

Research on underemployment in persons with SCI is limited; however, 1 study from Australia found 16.6% of participants with SCI who were currently working self-identified as underemployed, and males were more likely than females to report underemployment.[10] Some research suggests part-time and full-time employment after SCI are nearly equal in psychological benefit,[11] although preference for hours worked was not considered in that study. Limiting research on employment after SCI to employment status only and not also preference for participation level can result in issues such as underemployment being overlooked. Therefore, further research is needed to understand the nature of underemployment in the SCI population, including the perceptions of people with SCI.

Our purpose was to identify employment characteristics associated with self-reported underemployment among participants with SCI, controlling for demographic, injury, and educational factors. The results identify the job characteristics of those perceiving themselves to be underemployed, establishing a better foundation for vocational rehabilitation interventions to enhance the quality of the employment experience, including the match between expectations and actual job characteristics.

Methods

Participants

Institutional review board approval was obtained prior to initiating data collection, and signed documentation of consent was waived. We recruited participants for this study, entitled, *Quality Employment throughout the Work Lifecycle after SCI*, from 2 existing SCI longitudinal studies. These included the 40-Year SCI Longitudinal Aging Study,[12,13] focused on community outcomes, and the 15-year SCI Health and Longevity Study.[14] The SCI Longitudinal Aging Study enrolled participants from a university and specialty hospital in Minnesota in 1973, 1984, and 1993 and from a specialty hospital in the Southeastern United States in 1993 and 2002. The SCI Health and Longevity Study enrolled participants from the same specialty hospital in the Southeastern United States (1997, 2007, and 2011) and from 2 population-based surveillance systems (South Carolina in 2011 and Minnesota in 2014). All participants had traumatic SCI, were at least 18 years of age at assessment, and were injured before the traditional retirement age of 65. There were 2830 respondents to the quality employment study, which has been summarized elsewhere.[15] Of these, 966 were employed at the time of the study (34.1%) and were the focus of the current study. Fourteen participants were eliminated for missing data on perceived underemployment, reducing the sample to 952 participants. The data were collected between December 2015 and October 2017.

Procedures

Data were collected through mailed and web self-report assessment (SRA) using a single cross-sectional design. Participants were recruited through an introductory letter, which explained the study and notified participants that materials would be forthcoming. The SRA package was mailed 2-4 weeks later, and non-respondents were mailed follow-up packets 4-6 weeks later, followed by a phone call. Return of the materials was an indication of implied consent. Additional mailings were

implemented for those who had misplaced or discarded materials and requested an additional set of materials. The SRA was available online for those who requested it. Participants were offered $50 remuneration.

Measures

The SRA was used to measure multiple covariates of employment outcomes, including demographic, SCI, educational, and vocational characteristics (table 1). Demographic variables included race/ethnicity, sex, and marital/relation status. Race/ethnicity was grouped into 3 categories of 1) non-Hispanic White, 2) non-Hispanic Black, and 3) Hispanic/other. The Other category was used as there were too few participants within other groups to produce stable statistical estimates. Marital/relation status was included as 1) married/unmarried couple vs 2) divorced, widowed, separated, and never married. Educational attainment was broken down into 4 groups: 1) ≤high school certificate, 2) 2-year degree/trade school, 3) 4-year degree, and 4) postgraduate degree. These represent educational milestones individuals have fully completed the training (eg, having completed some junior college without having completed the program would be classified as having completed high school).

Several SCI factors were measured including time since SCI onset, which was categorized in years as 1) 9 years or less, 2) 10-19 years, and 3) ≥20. Age at injury onset was categorized as 1) less than 30, 2) 30-39, 3) 40-49, and 4) ≥50. SCI severity was measured using a combination of injury level and ambulatory status (a proxy measure for the American Spinal Injury Association Impairment Scale Grade D, incomplete impairment with motor function below level of injury), with participants categorized into 4 groups, 1 of which included all ambulatory participants, regardless of level. The 3 non-ambulatory groups were broken down into high cervical (C1-C4), low cervical (C5-C8), and non-cervical. This follows previous examples in the literature.[16,17]

Additionally, several employment characteristics were used. These include 5 occupational groups defined according to the Standard Industrial Classification Codes from the Department of Labor:[18] 1) management/professional, 2) service, 3) sales/office, 4) natural resources, construction, and maintenance, and 5) production/transportation/materials moving; full-time vs part-time employment; earnings broken down into 4 groups (< $20,000, $20,000-$49,999, $50,000-$74,999, and $75,000 or more); whether the current occupation provides job benefits (health insurance, vacation, cost of living raises, and sick leave); and lastly, whether it includes either a promotion or job recognition.

The sole outcome variable was perceived underemployment, which was dichotomous (yes, no). Employed participants were given the following item: "Underemployment occurs when workers who are highly skilled are working in low skill jobs or when people who want to work full-time are only working part-time. Do you consider yourself underemployed?" There is an absence of measures of underemployment in the literature, so this item was developed to measure whether the individual perceives themselves to be underemployed.

Table 1 Description of variables, breakdown of categories, and the number and percentage of participants in each category

Variables	N (%)
Sex	
Male	681 (70.5%)
Female	285 (29.5%)
Race/ethnicity	
Non-Hispanic White	834 (87.2%)
Non-Hispanic Black	71 (7.4%)
Hispanic/other	52 (5.4%)
Injury severity	
C1-C4, non-ambulatory	39 (4.2%)
C5-C8, non-ambulatory	155 (16.6%)
Non-cervical, non-ambulatory	249 (26.7%)
Ambulatory	489 (52.5%)
Age at injury	
Less than 30	495 (51.2%)
30-39	185 (19.2%)
40-49	138 (14.3%)
50>	148 (15.3%)
Time since injury	
9 y or less	289 (29.9%)
10-19 y	341 (35.3%)
20 or more y	336 (34.8%)
Relation status	
Married or unmarried couple	548 (56.7%)
Divorced, widowed, separated, never married	418 (43.3%)
Education	
High school certificate or less	260 (27.4%)
2-y degree/trade school	221 (23.3%)
4-y degree	280 (29.5%)
Postgraduate degree	189 (19.9%)
Perceive self as underemployed	
No	718 (75.4%)
Yes	234 (24.6%)
h/wk spent working	
<40 h	359 (37.2%)
≥40 h	607 (62.8%)
Income	
<$20,000	259 (27.5%)
$20,000-$49,999	308 (32.7%)
$50,000-$74,999	162 (17.2%)
$75,000 or more	213 (22.6%)
Occupational group	
Production/transportation/material moving	65 (7.0%)
Management/professional	364 (39.1%)
Service	124 (13.3%)
Sales/office	268 (28.8%)
Natural resources, construction, and maintenance	109 (11.7%)
Health insurance at current job	
No	393 (41.0%)
Yes	566 (59.0%)
Vacation at current job	
No	342 (35.8%)
Yes	614 (64.2%)
Cost of living raises at current job	
No	515 (54.3%)
Yes	433 (45.7%)
Sick leave at current job	
No	418 (43.9)
Yes	535 (56.1%)
Promotions at current job	
No	624 (65.6%)
Yes	327 (34.4%)
Receive recognition at current job	
No	744 (77.0%)
Yes	222 (22.3%)

Statistical analysis

Descriptive statistics were generated to describe the participant cohort. We estimated a fully adjusted logit model for underemployment of SCI with robust estimators to adjust for heterogeneity. We then estimated the predicted probabilities based on the fully adjusted model of underemployment

Table 2 Pseudo-R^2, change in the pseudo R^2, and OR for each vocational predictor when considered individually along with the basic restricted model

Variable	Pseudo R^2	Pseudo R^2 Change	OR[†]	95% CI[‡]		P
Basic restricted model	.048	—				
h/wk spent working (ref: <40 h)						
≥40 h	.104	.056	.28	.20	.39	<.001
Occupational group (ref: natural resources, construction, and maintenance)	.065	.017				
Management/professional			1.73	.95	3.14	.075
Service			1.81	.91	3.60	.090
Sales/office			2.88	1.62	5.11	<.001
Production, transportation, materials moving			1.45	.65	3.23	.366
Health insurance	.116	.068	.25	.18	.36	<.001
Promotions/recognition	.071	.023	.44	.32	.62	<.001
Income (ref: <$20,000)	.198	.150				
$20,000-$49,999			.26	.18	.39	<.001
$50,000-$74,999			.10	.05	.18	<.001
>$75,000			.03	.01	.07	<.001
Full model	.217	.169				

for the different values of each variable using the margins command in STATA 15.0.[a] Additionally, we generated additional logit models that evaluated employment covariates, 1 at a time, on top of the basic model that included only demographic, SCI, and educational characteristics. We calculated the pseudo-R squared for each model. We also generated predicted probabilities associated with each covariate to enhance the interpretation of the findings and the magnitude of differences attributable to the various covariates. Odds ratios (OR) and 95% confidence intervals (CIs) are reported.

Results

Descriptive

Most participants were male (70.5%) (table 1). The primary race/ethnicity was non-Hispanic White (87.2%), followed by non-Hispanic Black (7.4%) and Hispanic/Other (5.4%). Most of the participants were under the age of 30 at the time of injury (51.2%). When time since injury was broken down into categories by 10-year intervals, there were relatively equal portions of participants in each of 3 groups (ranging from 29.9 % to 35.3%). When broken down by injury level and ambulatory status, most participants (52.5%) were ambulatory. Most participants were either married or in a committed relation (56.7%). Just under half of the participants (49.4%) had either a 4-year degree or higher.

In terms of employment characteristics, just under one-fourth of participants perceived themselves to be underemployed (24.6%). Most participants were working full time (62.8%), and only 39.8% earned $50,000 or more per year. A somewhat smaller percentage of participants (59%) reported having health benefits from their jobs. Even fewer participants had received promotions (34.4%) or recognition (22.3%). The occupations with the highest portion of participants were management/professional (39.1%), followed by

sales (28.8), with the fewest participants working in production, transportation, and materials movement (7.0%).

Restricted model (1 predictor added to the basic model)

The basic model, which included demographic, SCI, and educational milestone factors, accounted for 4.8% of the variance (table 2). Two variables were significantly related to underemployment in the basic model (table 3): marital/relation status (OR=.45, 95% CI [.32, .63]) and having completed a postsecondary degree compared with those with less than a high school certificate (OR=.58, 95% CI [.35, .97]). Those married and those with postsecondary degrees had a lower odds of underemployment.

Each of the employment variables was significantly related to perceived underemployment in the restricted models. The pseudo-R squared ranged from a low of .065 for occupation (an increase of .017 above the restricted model) to a high of .198 for earnings (an increase of .15; table 2). For occupations, only sales/office was significantly elevated compared with natural resources, construction, and maintenance. Working full-time increased the pseudo-R squared to .104, as those employed full-time had .28 greater odds (95% CI [.20, .39]) of employment compared with those working less than 40 hours per week (part-time employment). Promotions/recognition also modestly increased the pseudo-R squared to .071 (OR=.44, 95% CI [.32, .62]), whereas health benefits made a stronger contribution to the pseudo-R squared, raising it to .116 (OR=.25, 95% CI [.18, .36]).). Both were associated with lower odds of underemployment.

Full model

In the full model, the pseudo-R squared increased to 0.217 (table 2). Of the non-vocational covariates, sex and marital/relation status were significant in the full model (table 3). Women were less likely to report being underemployed (OR=0.66, 95% CI [.44, .98]), as were participants who were

Table 3 The odds of underemployment related to demographic, SCI, and educational variables

Variable	OR	Restricted Model* 95% CI		p	OR	Full Model* 95% CI		p
Midwestern US (ref: Southeastern US)	1.09	.78	1.52	.610	1.17	.80	1.71	.412
Age at diagnosis (y; ref: <30)								
30-39	1.06	.68	1.62	.804	1.11	.70	1.76	.645
40-49	.88	.53	1.47	.625	.81	.43	1.50	.499
50>	.79	.46	1.36	.400	.72	.40	1.31	.284
Sex (ref: Male)								
Female	1.07	.75	1.52	.697	.66	.44	.98	.039
Time since injury (ref: 9 y or less)								
10-19 y	1.20	.80	1.79	.374	1.11	.71	1.75	.647
20 or more y	.85	.55	1.30	.458	.75	.47	1.20	.229
Race (ref: Non-Hispanic White)								
Non-Hispanic Black	1.34	.74	2.41	.331	1.18	.58	2.38	.654
Hispanic/other	1.10	.55	2.19	.790	1.14	.56	2.34	.716
Relation status (ref: never married, divorced, widowed, or separated)								
Married or unmarried couple	.45	.32	.63	<.001	.63	.42	.93	.021
Education (ref: high school certificate or less)								
2-y degree/trade school	.90	.58	1.4	.645	.99	.59	1.64	.955
4-y degree	.75	.49	1.15	.184	1.19	.72	2.01	.503
Postgraduate degree	.58	.35	.97	.037	1.45	.78	2.69	.239
Injury severity (ref: C1-C4, non-ambulatory)								
C5-C8, non-ambulatory	1.37	.59	3.16	.462	1.52	.53	4.35	.433
Non-cervical, non-ambulatory	.77	.34	1.75	.532	1.00	.36	2.83	.994
Ambulatory	.94	.42	2.09	.875	1.72	.62	4.81	.301
h/wk spent working (ref: <40 hours)								
≥40 h					1.42	.83	2.44	.199
Occupational group (ref: natural resources, construction, and maintenance)								
Management/professional					2.47	1.32	4.62	.005
Service					1.77	.87	3.58	.115
Sales/office					3.23	1.76	5.93	<.001
Production, transportation, materials moving					1.69	.70	4.07	.245
Health insurance					.58	.37	.91	.018
Promotions/recognition					1.00	.66	1.49	.983
Income (ref: <$20,000)								
$20,000-$49,999					.28	.16	.50	<.001
$50,000-$74,999					.11	.05	.23	<.001
>$75,000					.03	.01	.08	<.001

* The restricted model controls for all non-vocational factors and considers 1 vocational variable at a time, whereas, the full model controls for all other variables in the logistic regression analysis.

married/committed relations (OR=0.63, 95% CI [.42, .93]). Chronologic age, years since injury, race/ethnicity, injury severity, and educational status were not significantly related to underemployment status.

Of the vocational covariates, earnings, health benefits, and occupation were significant in the full model. For income, compared with the lowest income group, the ORs of underemployment decreased with each higher level of income ($20,000-$49,999=0.28; $50,000-$74,999=0.11; $75,000 and more=0.03). These differences translated into a range of predicted probabilities (table 4) of underemployment from .04 ($75,000 or more) to .52 for those earning less than $20,000 per year (or a range of predicted percentages from 4% to 52%). Those who had health benefits had lower odds of underemployment (OR=0.58, 95% CI [.37,

.91]); predicted probability of underemployment of .21 for those with health insurance, .29 for those without). Working in sales and management/professional occupations were significantly related to underemployment compared with those working in natural resources, construction, and maintenance (OR=3.23, 95% CI [1.76, 5.93] and OR=2.47, 95% CI [1.32, 4.62], respectively; predicted probability of underemployment of .30 and .26, compared with .16). Working full vs part-time and having had a promotion or recognition were not significant in the final model.

Discussion

A substantial amount of research has compared employment outcomes for people with SCI, or other disabling conditions,

Table 4 Predicted probability of underemployment with everything else held at their mean

Characteristic	Probability	Standard Error	95% CI	
Location				
Southeastern US	.24	.02	.21	.28
Midwestern US	.26	.02	.22	.30
Age at injury (y)				
<30	.26	.02	.22	.29
30-39	.27	.03	.21	.33
40-49	.22	.04	.15	.30
50>	.21	.04	.14	.28
Sex				
Female	.27	.02	.24	.30
Male	.20	.02	.16	.25
Time since injury				
9 y or less	.26	.03	.21	.30
10-19 y	.27	.02	.22	.31
20 or more y	.22	.02	.18	.26
Race/ethnicity				
Non-Hispanic White	.25	.01	.22	.27
Non-Hispanic Black	.27	.05	.17	.38
Hispanic/other	.25	.05	.15	.35
Relation status				
Divorced/widowed/separated/never married	.29	.02	.24	.33
Part of a married or unmarried couple	.21	.02	.18	.25
Education				
High school certificate or less	.24	.02	.19	.28
2-y degree/trade school	.23	.03	.18	.28
4-y degree	.26	.03	.21	.31
Postgraduate degree	.29	.04	.22	.37
Injury severity				
C1-C4, non-ambulatory	.18	.06	.06	.30
C5-C8, non-ambulatory	.25	.03	.19	.31
Non-cervical, non-ambulatory	.20	.02	.16	.25
Ambulatory	.28	.02	.24	.32
Hours per week spent working				
<40 h	.23	.02	.19	.27
$\geq$ 40 h	.27	.02	.22	.31
Occupational group				
Production/transportation/material moving	.21	.05	.11	.30
Service	.22	.03	.15	.28
Management/professional	.26	.02	.21	.31
Sales/office	.30	.03	.25	.35
Natural resources, construction, and maintenance	.16	.03	.10	.23
Health insurance				
No	.29	.02	.24	.33
Yes	.21	.02	.17	.25
Promotions or recognition				
Not promoted or recognized	.25	.02	.21	.28
Promoted or recognized	.25	.02	.21	.30
Income				
<$20,000	.52	.05	.41	.62
$20,000-$49,999	.25	.03	.20	.30
$50,000-$74,999	.12	.03	.06	.17
$75,000 or more	.04	.01	.01	.07

to that of the general population, most of which have quantified differences in employment rates or the employment/population ratios.[19,20] Minimal research has focused on quality outcomes among those employed, such as salary[15,21-23] or quality of benefits.[24] We only identified 1 study that looked at underemployment with SCI.[10] The current study

addresses an important gap in the literature by identifying how key demographic, injury, educational, and vocational factors relate to *perceived underemployment*.

Several important findings arose with similarities and differences to existing employment research using other employment outcomes. Previous research has consistently found education as a powerful predictor of employment status and quality employment outcomes, including earnings and benefits.[15,21,22,25,26] In the current study, education was only modestly related to perceived underemployment, with those having postsecondary degrees being less likely to report being underemployed, but no differences were seen in the full econometric model. This suggests perceptions of underemployment occur at all levels of education, not simply among those with limited education. This is reinforced by findings that participants working in sales and professional/managerial occupations were more likely to report being underemployed than people working in natural resources, construction, and maintenance occupations. These findings likely relate to the extent to which individuals view themselves as valued employees, within the context of their occupation, and raise a potential risk of inequities in opportunities for people with SCI. People who work in more basic fields, like natural resources, construction, and maintenance, may also have lower expectations that differ from those who work in sales and professional/managerial occupations, leading to lower perceptions of underemployment. The current study raises as many questions as it answers.

Demographic and injury factors were not strong predictors of underemployment, with marital/relation status being the most prominent covariate. Even when entered into the basic model along with education, they accounted for only 4.8% of the variation in underemployment. The absence of significant relations for both race/ethnicity and injury severity is also contrary to previous research in which consistent disparities in employment outcomes based on these characteristics has been found. Furthermore, women were less likely to report being underemployed, with this translating into approximately 7% difference in the predicted percentage of those perceiving themselves to be underemployed. The absence of racial/ethnic, sex, and injury severity disparities in perceived underemployment is encouraging. However, these findings should not be taken as the absence of true relations on underemployment per se, rather than perceived underemployment.

Not surprising, earnings were the strongest predictor of underemployment, with full-time employment only significant during the restricted analysis where the only statistical controls were demographic, SCI, and educational variables. The magnitude of the relation, after controlling for all other factors, was large, with a predicted percentage of only 4% perceiving themselves to be underemployed in the highest income category compared with 52% for those in the lowest income category. Although less pronounced, 25% of those in the next lowest income category ($25,000-$49,999) still considered themselves to be underemployed. Therefore, having a reasonable income is essential to a successful outcome where people feel their jobs are consistent with their qualifications and needs. Having job benefits was clearly related to underemployment in the restricted and full analysis, and having promotions or recognition was also significant during the restricted analysis. Therefore, even though earnings are

most important, other indicators of quality employment are important to individuals' perceptions of whether their employment is consistent with their self-evaluations. Specifically, having job benefits and opportunities for promotions and recognition are important considerations for people with SCI, and the absence of these may undermine the quality of the individual's employment experience.

Implications for counselors and rehabilitation professionals

The findings have several important implications for practice. First, although employment success is typically determined by employment status and measured by changes in employment rates,[19,20] perceived underemployment is prevalent among those with SCI, even those working in higher-level positions. Counselors must be aware that helping individuals with SCI obtain and retain employment does not mean the vocational outcome is acceptable to the individual with SCI. Therefore, even those cases considered successfully closed by virtue of individuals working beyond the 90-day probationary period, some individuals may be working at a job they feel is beneath their skills or expectations. Second, given the relations of earnings and benefits with perceived underemployment, the findings emphasize the importance of maximizing tangible benefits of quality employment. It should not be assumed that working in even professional/managerial occupations will ensure satisfactory employment. Sales positions might seem like a good option for people with SCI in terms of limited needs for motor function, but, in this study, there was a very high probability of perceived underemployment in those positions. So, counselors should not have a hierarchy of occupations in mind but, rather, evaluate the extent to which the occupation will meet the individual's needs. Third, having opportunities for promotion and recognition, both of which reflect career development and progression, is important to employment success from the perspective of the individual with SCI. These variables have not received proper attention in previous research, and they clearly are indicators of individual's evaluation of the quality of their employment (ie, perceived underemployment). Fourth, although not specifically the focus of this study, the existence of underemployment among those in highly skilled jobs suggests the need to consider work disincentives as part of the counseling process. It is possible that economic disincentives that place a maximum on earnings lead to career stagnation. Lastly, it is essential to gain individual perspectives in evaluating vocational success. External markers, like employment rates or even type of occupation, may mask perceptions of being in jobs which do not maximize the individual's potentials or meet his/her needs.

Study limitations

First, all data on covariates were self-report. Recall bias is always a concern in self-report studies. Second, underemployment was measured by subjective appraisals, so the findings help us to define underemployment from the perspective of the individual with SCI. However, studies that use alternative criteria may produce different findings. Of

particular relevance, we used a single item to measure underemployment, so further validation is required. Additionally, selective response could have affected the results. For instance, it is possible that those who view themselves as underemployed were more or less likely represented in the cohort. We cannot determine this with the current study. Lastly, the data were cross-sectional. Therefore, we could not determine how employment factors may affect future perceptions of underemployment or other quality indicators.

Future research

Additional research is needed in several areas. First, there is a clear need to establish better benchmarking data within the general population. As it stands, there currently are no questions to measure underemployment in the Current Population Survey. Second, we need to identify the relation of subjective underemployment with objective measures. Third, it is important to identify the consequences of underemployment on outcome measures, including employment specific measures of career and job satisfaction, as well as more global outcomes that include health, participation, and quality-of-life. This will balance the current focus which helps to identify the nature of subjective reports of underemployment. We must also continue to investigate other quality employment indicators in relation to multiple employment outcomes. As always, intervention studies are needed to identify means of promoting quality employment outcomes throughout the work lifecycle.

Conclusions

Underemployment is an important indicator of quality employment after SCI and is related to earnings level and other indicators of job quality, including the provision of fringe benefits and having opportunities for recognition and promotion. However, the relation of perceived underemployment with education and job quality is complex, as education is not highly related to underemployment, and working in sales and professional/managerial occupations is related to a greater likelihood of perceptions of being underemployed.

Suppliers

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Corresponding author

James S. Krause, PhD, College of Health Professions, Medical University of South Carolina, 151-B Rutledge Ave, MSC 962, Charleston, SC 29425. E-mail address: krause@musc.edu.

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