Race, Employment, and Spinal Cord Injury

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Objectives: To examine issues of employment and race for persons with spinal cord injury (SCI), by assessing the type of work that was being done before and after injury and by placing this in the context of patterns for the general population.

Design: Retrospective, cross-sectional analysis.

Setting: Centers funded as part of the federally sponsored Model Spinal Cord Injury Systems (MSCIS) Project.

Participants: Two samples: 5925 African Americans and whites with SCI who are part of the MSCIS and a subset of 577 people with SCI.

Interventions: Not applicable.

Main Outcome Measures: Demographic information, occupational status, employment rate, job census codes, Craig Hospital Assessment and Reporting Technique–Short Form, and Satisfaction With Life Scale.

Results: Racial disparities were found in employment rates before injury and at 1, 5, 10, 15, and 20 years after SCI. Differences were also found in the types of jobs that were held before SCI with patterns for participants similar to those of African Americans and whites in the general population. No differences were found in the types of jobs held by African Americans and whites with SCI at 1 year after injury. After injury, African Americans had lower economic self-sufficiency scores, regardless of employment status, and lower social integration scores among those who were not employed.

Conclusions: Racial disparities found in employment patterns among persons with SCI mirrored patterns among the general population.

Key Words: Employment; Race; Rehabilitation; Spinal cord injuries.

AMONG THE MANY CHALLENGES confronting persons with spinal cord injury (SCI) is finding and securing employment after injury. Research[1-7] has shown that the level of employment after SCI is dramatically low. This is particularly significant because employment is viewed as among the primary indications of successful rehabilitation and the pinnacle of community integration.

Employment has psychologic, social, financial, and political implications. Psychologically, employment is positively associated with life satisfaction and quality of life (QOL).[8-13] With regard to overall health, those employed have been found to be behaviorally more active, to require fewer medical treatments, to complete more years of education, to perceive themselves as having fewer problems, to report being more satisfied with their lives, and to rate their overall adjustment higher than those who were unemployed.[10-12] Financially, employment provides a means of supporting one's self and family, facilitates access to health care services, and serves as a basis for relationships and personal identity. Equally important, persistent disparities in employment are often interpreted as failure of a broad range of social policies. Disparities serve as notice that additional research needs to be done or more effective policies need to be implemented. Additionally, some scholars attribute disparities to deficiencies in the quality of clinical care or patient education and call for modification or reconsideration of traditional interventions, to ensure more successful rehabilitation and social reintegration.

Although there has been some variation in reports of the relationships between occupational status after SCI and the other factors, race is the factor most consistently associated with low employment rates. Studies[9,14-18] examining this variable have found that whites are more likely to be working than African Americans. The strength of this variable is so robust that, even when education is controlled for, 1 study[15] found that white participants were 2.8 times more likely than minority participants to be working.

This racial disparity in employment status after SCI resembles results of research on general employment patterns in the United States. Research[19-24] has consistently shown disparities based on race. As Anderson notes:

> A cursory examination of employment status, wages and family incomes has long shown black Americans in a consistently inferior position compared with white Americans on almost every measure of economic well-being. . . . broad racial disparities in economic status persist despite a significant narrowing of productivity differences between population groups. . . . Indeed, by some measures racial inequality in income has worsened in recent years.[25(p77)]

Persons with SCI list many reasons for not working. Among those most frequently reported are a physical inability to perform the same type of work postinjury (60%); poor health, stamina, or endurance (28%); loss of benefits (28%); not feeling physically capable of working (27%); inaccessibility of the workplace (23%); and lack of transportation.[26] Researchers have examined the issue with regard to factors associated with job, demographic variables, injury-related factors, and psychosocial factors. Some research has shown that education seems to remain a significant predictor of employment status for African Americans. However, other research[27] suggests that education alone does not account for enduring racial disparities in the general African-American population. Although there

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has been considerable speculation about what factors explain racial disparities in employment status of those *without* SCI, more research is needed to explain the relation between race and employment status after SCI.

The studies that have been conducted have tended to focus primarily on service agencies and delivery.[28] A few studies[29-34] have reported inequality issues with regard to access and quality of services that people with disabilities of minority racial and ethnic origin experience compared with their white counterparts. There is often strong mistrust among minorities who have endured negative experiences in seeking assistance in rehabilitation.[35-37] The need for rehabilitation services to become more culturally sensitive has been acknowledged.[38-41] However, 12 years after the US Rehabilitation Act amendments addressed the issue, state rehabilitation agencies have continued to struggle with the provision of effective services to underserved populations from minority racial and ethnic backgrounds.[42]

The purpose of our study was to take a closer look at the issue of employment and race for 1 racial minority group—African Americans—as it impacts people from this population who are living with SCI, by examining the type of work that is being done before and after injury and by placing this in the context of patterns for the general population. Related issues of social integration, economic self-sufficiency, and life satisfaction will also be examined. The implications of the results as they pertain to successful rehabilitation and community reintegration will also be considered. Because different ethnic and racial groups are affected differently by socioeconomic forces, we have limited our discussion to African Americans, who, as a group, have been primary targets for discrimination, are twice as likely as whites to be unemployed,[43] have one third of its population living below the poverty line,[43] and have the lowest life expectancy of any group in the United States.[44]

Based on the reviews of both the SCI and social science literature, the following hypotheses were proposed: (1) racial differences exist in employment status both before and after SCI; (2) these differences are not accounted for by differences in educational level; (3) African Americans and whites engage in different types of employment (as reflected by job census code) both before and after injury; and (4) differences in community reintegration and satisfaction with life exist based both on employment status and on racial background.

METHODS

This study applied a comprehensive and retrospective cross-sectional review of the National Spinal Cord Injury Database (NSCID) patients between 1972 and 2002. All centers reporting data were participants in the Model Spinal Cord Injury (MSCIS) program funded by the US Department of Education's National Institute on Disability and Rehabilitation Research. All participants were citizens of the United States. Although eligibility criteria have been revised several times since its inception in 1972, as of October 2000, all patients admitted into the MSCIS must (1) receive either system acute care and/or system inpatient rehabilitation and/or an organized program of system outpatient or day rehabilitation; (2) be treated at an MSCIS within 1 year of injury; (3) have a clinically discernible degree of neurologic impairment after a traumatic event; (4) have given informed consent; and (5) reside in the geographic catchment areas of the MSCIS at the time of injury.

Data Collection

Data for each patient were collected according to standard MSCIS procedures during inpatient rehabilitation and at the 1st, 5th, 10th, 15th, and 20th anniversaries of their injuries.[45] Appropriate members of the interdisciplinary rehabilitation team, using standard protocols, determined categories of neurologic impairment and other relevant outcomes. Experienced clinicians at each center collected data from a variety of sources, including medical records, team conferences, and patient and family interviews. Follow-up information was collected during in-person or telephone interviews, mail surveys, and/or chart reviews.

Study Eligibility

For this analysis, patients were grouped according to racial background, and only participants classified as white/Caucasian or African American/black were included. Although Hispanic origin is collected as part of the MSCIS database, Hispanics/Latinos were not used as a distinct ethnic group for this study, for several reasons: (1) because of the high percentage of data that is missing; (2) because of lack of standardization about how this factor is collected and assessed (eg, if patients are asked about or if Hispanic origin is assumed); and (3) because of its overlap with racial groups—people from either white or African-American backgrounds can be categorized as being of Hispanic origin.

Two groups of participants were analyzed for this study: the first, and larger, group consists of participants who were injured between 1972 and 2002 and were classified as either African American or white in NSCID. Only people who were between the ages of 18 and 65 years at the time of injury and who had complete information for racial group and employment status at injury were included in the analysis. Information for this group was then divided into outputs of those providing cross-sectional information at 1, 5, 10, 15, and 20 years postinjury. The second group consisted of a subset of participants from the first group, on whom complete information on job census code was collected at the time of MSCIS admission and at the first anniversary of injury. This subset was limited to participants treated at 1 of 16 MSCIS between 2000 and 2002.

Measures

Participants had information collected on admission to the MSCIS and at anniversaries of injury. The following variables are used in this analysis.

Occupational status. Participants were categorized as working, homemaker, on-the-job training, retired, student, unemployed, or other, unclassified. In the NSCID, participants are asked their primary occupational status (eg, working, school, unemployed). If the person is in 1 of these categories—such as working and in school—they are asked which is the primary category.[46]

Employment status. Occupational status was recoded as a dichotomous variable, to be used as an outcome measure. Persons were classified as either employed (only subjects categorized as engaging in paid employment) or unemployed (students, homemakers, unemployed, other).

Job census code. This variable was coded based on the 1990 Occupational Classification System, which was created by economists for the purpose of data collection and comparison.[47]

Craig Handicap Assessment and Reporting Technique–Short Form. The Craig Handicap Assessment and Reporting Technique–Short Form[48] (CHART-SF) is a 19-item measure that assesses 5 dimensions of handicap, including physical independence, mobility, occupation, social integration, and economic self-sufficiency. It was designed for use with adults with physical disabilities living in the community. Higher

Table 1: Demographics and Characteristics

Demographic Characteristics	Overall (N=5925)	Whites (n=4210)	African Americans (n=1715)	Statistics
Mean age ± SD (y)	32.84±12.55	32.78±12.58	32.99±12.48	F=.338, *P*=.561
Sex (%)				χ^2_1=22.746, *P*<.001
Male	81.9	80.3	85.6	
Female	18.1	19.7	14.4	
Race (%)				
White	71.1	NA	NA	NA
African American	28.9	NA	NA	
Etiology of injury (%)				χ^2_4=1406.251, *P*≤.001
Vehicular	42.6	49.8	24.9	
Violence	19.8	7.8	49.4	
Sports	10.0	13.3	2.1	
Falls	19.7	20.7	17.4	
Other	7.8	8.5	8.5	
Neurologic impairment (%) (at discharge from system)				χ^2_7=32.060, *P*<.001
Paraplegia, incomplete	21.2	21.6	20.2	
Paraplegia, complete	28.2	26.4	32.4	
Paraplegia, minimal deficit	0.2	0.2	0.3	
Tetraplegia, incomplete	31.6	31.7	31.2	
Tetraplegia, complete	18.5	19.7	15.4	
Tetraplegia, minimal deficit	0.3	0.3	0.5	
Highest level education at injury (%)				χ^2_7=403.544, *P*<.001
8th grade or less	6.0	4.5	9.6	
9th through 11th grades	20.9	15.6	34.1	
High school diploma or GED	59.4	62.9	50.4	
Associate's degree	2.6	2.9	1.8	
Bachelor's degree	7.8	9.9	2.3	
Master's degree	1.6	2.1	0.4	
Doctorate (PhD, MD, JD, or other)	0.9	1.2	0.1	
Other, unclassified	0.9	0.8	1.2	

Abbreviation: NA, not applicable.

scores correspond with less handicap or interference with participation as a result of physical impairment. Test-retest reliability over a 1-week interval ranged from .80 to .95 for individual dimensions and .93 for overall score. Validity of the instrument has been judged as good.[49] For this study, only total CHART-SF scores and social integration and economic self-sufficiency subscale scores were used.

Satisfaction With Life Scale. The Satisfaction With Life Scale (SWLS) is a 5-item, self-report measure of life satisfaction developed by Diener et al.[50] Total scores range from 0 to 35, with higher scores reflecting higher levels of satisfaction with life. The SWLS has been shown to have a strong internal validity (Cronbach α range, .80–.87) and good test-retest reliability (range, .50 at 10wk to .83 at 2wk).[51] The scale has been used with numerous populations, including both able-bodied subjects and persons with SCI.[52]

Statistical Analyses

Descriptive statistics, including proportions, means, and standard deviation (SD) were compiled for all demographic and outcome measures. Chi-square nonparametric statistics were used to examine between-group differences on nominal and ordinal level variables; 1-way analysis of variance (ANOVA) was used to compare differences for ratio-level data.

To test the first hypothesis, differential statistics were used, including chi-square tests and ANOVAs. Because of the dichotomous nature of the outcome variable (employment), the second hypothesis was tested using logistic regression analyses, to account for the effect of education and other potential covariates on employment status. For this analysis, those variables found that differed significantly between groups and were theoretically relevant were entered in blocks one at a time before entering "race" into the equation. Descriptive and differential (χ^2) statistics were used to test the third hypothesis. Because of issues of homoscedasticity and small sizes in some groups, nonparametric statistics (Kruskal-Wallis χ^2) were used to explore the relationship among race, employment, and psychosocial variables at 1 year postinjury (hypothesis 4). Consistent with traditional statistical procedures, an α level of *P* equal to .05 or less was deemed acceptable.

RESULTS

Description of Samples

The first, and larger, group consisted of 5925 subjects who were injured between 1972 and 2002. Complete information regarding demographics, injury etiology, and injury characteristics for each group is presented in table 1. Most of these subjects were men (81.9%), white (71.1%), injured in a motor vehicle crash (42.6%), had incomplete tetraplegia (31.6%), and had a high school diploma or General Educational Development (GED) diploma (59.4%). All subjects provided information at 1 year postinjury, 2852 provided information at 5 years postinjury, 932 provided information at 10 years postinjury, 375 at 15 years postinjury, and 162 at 20 years postinjury.

Table 2: Occupational Status of Entire Sample (N=5895)

Occupation	Preinjury (%)	1 Year Postinjury (%)
Working	66.3	13.5
Homemaker	1.9	1.8
On-the-job training	0.3	0.3
Sheltered workshop	0.1	0.1
Retired	2.3	4.1
Student	9.1	10.9
Unemployed	18.7	63.4
Other, unclassified	1.4	5.9

Significant differences existed between African Americans and whites with regard to gender, etiology of injury, category of neurologic impairment, and highest level of education at the time of injury. African Americans were more likely to be male, to have suffered their SCI as a result of violence, to have complete paraplegia, and to have received less education than whites.

The second sample used in this analysis was a subgroup of people from the first sample. This subset was limited to 577 people who were treated at 1 of 16 MSCIS between 2000 and 2002 and who had provided information about job type both at the time of injury and at the first anniversary. Participants in this group were predominantly male (78%) and white (77.5%). Patients' mean age ± SD at the time of injury was 36.13±12.99 years (median age, 35y). At the time of injury, 20% of patients had less than a high school education, 61.4% had completed high school or obtained a GED diploma, 4.1% had an associate's degree, 9.7% a bachelor's degree, 2.2% a master's degree, and 1.6% a doctorate or other professional degree. At the time of discharge from rehabilitation, most participants were classified as having incomplete tetraplegia (33.7%), complete paraplegia (27.9%), or complete tetraplegia (20.1%). Once again, significant differences were found between racial groups with regard to educational level at injury (χ^2=53.269, P<.001) and etiology of injury (χ^2=80.66, P<.001). However, for this subset, no significant differences were found with regard to age at injury (F=2.79, P=.095), gender (χ^2=.022, P=.883), or category of neurologic impairment at discharge (χ^2=3.85, P=.571).

Occupational Status

Occupational status was examined for participants at the time of injury and 1 year after injury (table 2). Overall, 66.3% of participants (N=5925) were identified as employed at the time of injury, and another 11.4% were engaged in other types of productive activities (eg, homemaker, on-the-job training, sheltered workshop, student). In contrast, only 13.5% of subjects were classified as working at 1 year postinjury, with another 13.2% classified as being in "other" productive roles.

As seen in table 3, preinjury occupational status was not evenly distributed between groups (χ^2_7=597.838, $P\leq$.001); whites had significantly higher employment rates than African Americans. At 1 year after injury, significant differences between racial groups were visible to an even greater degree (χ^2_7=216.538, $P\leq$.001); 16.4% of whites were categorized as working or employed at the first anniversary of injury, whereas only 5.9% of African Americans were employed. In addition, the percentage of African Americans identified as students remained the same after injury (≈6%), whereas that of whites (which was higher to start with) increased (from 10.3% to 12.8%).

Table 3: Occupational Status by Racial Group

Occupation	Time Period	Whites (n=4194) (%)	African Americans (n=1715) (%)
Working	Pre	72.9	49.9
	Post	16.4	5.9
Homemaker	Pre	2.2	1.2
	Post	2.2	1.0
On-the-job training	Pre	0.3	1.2
	Post	0.4	0.2
Sheltered workshop	Pre	0.1	0.0
	Post	0.1	0.0
Retired	Pre	2.2	2.8
	Post	4.0	4.5
Student	Pre	10.3	6.0
	Post	12.8	5.8
Unemployed	Pre	11.0	37.4
	Post	57.9	78.0
Other, unclassified	Pre	1.0	2.4
	Post	6.3	4.7

Abbreviations: Pre, preinjury; Post, postinjury.

Employment Rate

Using cross-sectional data from the 5925 people, the overall percentage of the sample categorized as "working" increased with years since injury (fig 1). After injury, 11.9% self-identified as being employed at 1 year postinjury (N=5925), 18.7% at 5 years postinjury (N=2852), 22% at 10 years postinjury (N=932), 22.2% at 15 years postinjury (N=375), and 22.9% at 20 years postinjury (N=162).

However, when the sample is examined by race, distinct differences existed both before and after injury (fig 2). Once again, there are significant differences between racial groups with regard to employment status at each time period (at time of injury, χ^2=290.34, P<.001; 1y postinjury, χ^2=110.32, P<.001; 5y postinjury, χ^2=99.62, P<.001; 10y postinjury, χ^2=62.80, P<.001; 15y postinjury, χ^2=24.96, P<.001; 20y postinjury, χ^2=17.90, P<.001).

Because racial disparities were found in employment at anniversary of injury, a logistical regression was conducted to determine whether race explained a significant amount of variance beyond that by educational level at anniversary of injury and other variables found to differ between the 2 groups. In the model, number of years since injury was entered as the first block in the equation and was significant. Educational level at anniversary was entered next (significant), then category of

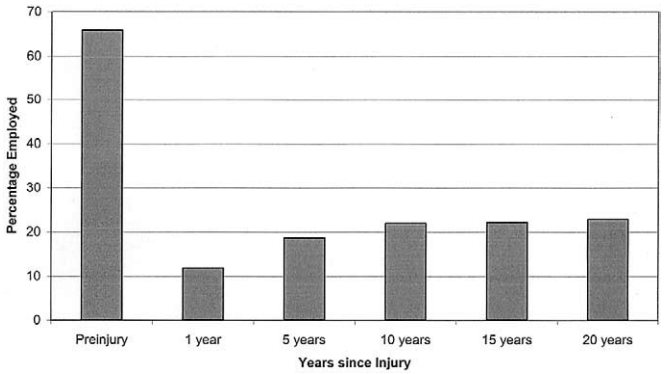

Fig 1. Overall employment rates of persons with SCI.

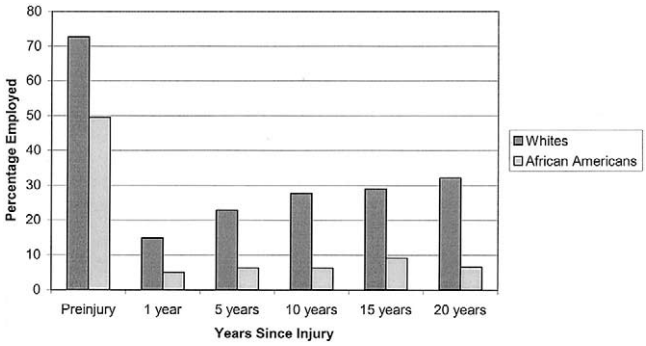

Fig 2. Employment rates of African Americans and whites with SCI.

neurologic impairment at discharge (significant), age at injury (significant), and gender (significant). Finally, race was entered and was significant, even after portioning out the variance accounted for by the other factors. Table 4 presents the final logical regression. The Cox and Snell R^2 for the final equation was .123; the Nagelkerke R^2 was .202.

Job Type

Before injury, African Americans and whites were employed in different types of jobs ($\chi^2=26.78$, $P=.013$). For whites, the most common occupational categories at the time of injury were precision production, craft, and repair (22.1%); profession specialties (10.3%); and executive, administrative, and managerial (6%). A similar pattern is not reflected for African Americans, whose most common occupational categories were service (except protective and household; 9.2%); handlers, equipment cleaners, helpers, and laborers (8.5%); and precision production, craft, and repair (7.7%). In contrast, at 1 year postinjury, the relative frequency of occupational category distribution did not differ significantly between African-American and white participants ($\chi^2=7.51$, $P=.757$), with professional specialty occupations being the most common. Table 5 provides more information on these patterns.

Economic Self-Sufficiency, Social Integration, and QOL

Mean scores were computed for satisfaction with life, economic self-sufficiency, social integration, and total CHART-SF score. Participants had a mean SWLS score ± SD of 17.11±8.18, a mean economic self-sufficiency score of 67.20±34.75, a mean social integration score of 86.60±22.71, and a mean total CHART-SF score of 442.50±114.39. Differences between racial groups were noted with regard to economic self-sufficiency ($F=29.60$, $P<.001$), social integration ($\chi^2=5.77$, $P=.016$), and total CHART-SF scores ($F=21.57$, $P<.001$), with African Americans consistently showing lower scores than whites.

Differences between racial and employment groups were also explored. Because of the low frequency of African Americans employed at 1 year postinjury (n=7), nonparametric statistics were calculated to assess between-group differences. As can be seen in table 6, among people who were employed, there was a significant difference between African Americans and whites with regard to economic self-sufficiency. For people who were not employed, African Americans had significantly lower scores on measures of social integration, economic self-sufficiency, and total CHART-SF scores.

Table 4: Employment Rates: Final Logistic Regression Model for Employment at Anniversary of Injury

Predictors	β	SE	Wald χ^2	df	P
Block 1: year since injury	.061	.006	94.707	1	.000
Block 2: education level on anniversary	.542	.023	567.012	1	.000
Block 3: category of neurologic impairment at discharge	−.219	.020	117.942	1	.000
Block 4: age at injury	−.015	.003	34.113	1	.000
Block 5: gender	−.233	.077	9.038	1	.003
Block 6: race	−1.195	.090	175.917	1	.000
Constant	−.829	.187	19.571	1	.000

Abbreviation: SE, standard error.

Table 5: Job Census Codes by Racial Group

Variable	Time Period	White (n=447) (%)	African American (n=130) (%)
Executive, administrative, and managerial	Pre	6	1.5
	Post	3.1	.8
Professional specialty	Pre	10.3	6.2
	Post	4.7	2.3
Technicians and related support	Pre	2.7	1.5
	Post	1.1	0.8
Sales	Pre	4.5	5.4
	Post	2.0	0.8
Administrative support, including clerical	Pre	3.4	3.1
	Post	0.9	0.0
Private household	Pre	0.4	0.0
	Post	0.2	0.0
Protective service	Pre	0.7	0.8
	Post	0.0	0.0
Service, except protective and household	Pre	5.1	9.2
	Post	0.7	0.8
Farming, forestry, and fishing	Pre	2.5	0.0
	Post	0.9	0.0
Precision production, craft, and repair	Pre	22.1	7.7
	Post	2	0.0
Machine operators, assemblers, and inspectors	Pre	4.7	3.8
	Post	0.2	0.0
Transportation and material moving	Pre	4	6.2
	Post	0.2	0.0
Handlers, equipment cleaners, helpers, and laborers	Pre	5.4	8.5
	Post	0.2	0.8
Military occupations	Pre	0.2	0.0
	Post	0.0	0.0
Not applicable, not working	Pre	28.0	46.2
	Post	83.7	93.8

DISCUSSION

African Americans and other racial and ethnic minorities are overrepresented among people with traumatic SCI who are followed by the MSCIS.[53] Although this may reflect the composition and location of the centers participating in the project, it seems more likely a reflection of the nature of the injury. For example, people with SCI resulting from a gunshot wound are significantly more likely to be younger, unmarried, unemployed, and of minority (nonwhite) ethnic backgrounds.[53] African Americans have the highest percentage of people who

Table 6: Mean Scores for Subset of Subjects (n=577) at 1 Year Postinjury

Employment Status	Measure	White	African American	χ^2 and Significance
Employed	Economic self-sufficiency (CHART subscale)	91.36±22.63	57.40±45.37	χ^2=5.050, *P*=.025
	Social integration (CHART subscale)	95.33±11.89	96.57±9.07	χ^2=.084, *P*=.772
	CHART total	564.15±59.19	547.26±80.52	χ^2=.070, *P*=.792
	SWLS	22.01±8.41	20.29±8.60	χ^2=.569, *P*=.451
Not employed	Economic self-sufficiency (CHART subscale)	67.31±34.58	47.76±30.77	**χ^2=17.371, *P*≤.001**
	Social integration (CHART subscale)	86.26±22.68	81.05±26.97	**χ^2=3.976, *P*=.046**
	CHART total	431.98±106.06	375.81±104.89	**χ^2=14.438, *P*≤.001**
	SWLS	16.49±7.91	15.56±7.67	χ^2=1.143, *P*=.285

NOTE. Values are mean ± SD; bold = significance.

are victims of violent crimes, and American Indians have the highest percentage of people with unintentional accidents.[54]

In the report *Changing America*, compiled for the President's Initiative on Race,[55] significant differences were found between racial and ethnic groups, with non-Hispanic African Americans, Hispanics, and American Indians experiencing significant disadvantaged health, education, and economic status in comparison with non-Hispanic whites and Asians. Smart and Smart[56] targeted 5 socioeconomic factors as explaining the disproportionate percentage of disabilities among minorities, including low income and poverty, employment in physically dangerous jobs, lack of insurance coverage, and low educational attainment. A more thorough discussion of this topic can be found in their 1997 article.[56]

These factors come into stark illumination when examining the issues associated with employment for persons with SCI. In this study, as in other studies, distinct differences were seen between African Americans and whites with regard to both primary occupational status and job classification at the time of injury. African Americans had lower employment rates (50% vs 73%) and higher rates of unemployment (37% vs 11%), and those who were working were more likely to be employed in lower-paying jobs (eg, laborer and service occupations) than were whites. In addition, fewer African Americans were students (6% vs 10%).

After injury, the gap in employment rates between the racial groups appears larger. Although both whites and African Americans were employed at much lower rates after traumatic SCI, the employment rate for whites appears to gradually increase with time after injury, whereas that of African Americans appears fairly stable at a much lower rate. The differences in employment rates between the 2 groups were significant even when the variance explained by education level and injury-related factors (ie, duration of injury, age at injury, category of neurologic impairment) have been taken into account. In addition, the gap in student status (5.8% vs 12.8%) also appeared to grow, which suggests decreased future potential for employment for African Americans because education and employment preparation are important variables in the employment success of people with disabilities.

In contrast with preinjury patterns and the expectation presented in hypothesis 3, the most common job classifications after injury were similar between racial groups—although the frequency of participants in each category remained significantly lower for African Americans than for whites. For both groups, persons with SCI seemed most likely to go into or to return to professional specialties, administrative occupations, and sales—all occupations that are likely to be associated with more education and less manual labor. Few individuals held positions in service or transportation industries or as machine operators, laborers, or associated jobs after injury. No one was employed in protective service or military occupations at 1 year postinjury.

Results from our study provide mixed support for hypothesis 4, which stated that differences in community reintegration and satisfaction with life exist based on both employment status and racial background. As has been found in other studies, participants in our sample who were employed showed higher levels of economic self-sufficiency, social integration, and satisfaction with life than those who were not employed. Moving beyond that, however, in this sample, racial differences were found among individuals of similar occupational status. Among those who were not working at 1 year postinjury, African Americans with SCI had significantly lower scores on measures of economic self-sufficiency and social integration than did whites. Among those who were employed, economic self-sufficiency scores for African Americans were significantly lower than for whites. The lack of racial disparity in social integration scores among those who were employed, however, is encouraging.

Although these trends are familiar and consistent with the literature, the descriptive nature of information provides the opportunity to put the data within a larger social context and to gain understanding and insight into the life situations and challenges faced by many persons with SCI. Nationally, the unemployment rate among African-American men is more than double that of white men (11.2% vs 4.9%, respectively, in 2003).[57] The unemployment problem is particularly acute among African Americans in the inner cities because of the exodus of manufacturing and service firms to the suburbs, compounded by the growth of part-time and temporary employment, the drop in unionization, and the low level of small business ownership and entrepreneurship among African Americans.[58] Young African-American men have been the most severely affected by these problems, and their early experiences in the job market may influence their long-term employment prospects.[59]

Employed African-American men are less likely than white men to work in managerial or professional positions. For instance, whereas high proportions of African Americans work in manufacturing, transportation, services, and public administration, relatively few have risen to the managerial or professional level in these industries. In 1996, of 17,155 managerial and professional jobs held by men in these industries, 5% (996) were filled by African-American men and 87% (15,299) by white men.[60]

Historically, occupational and income disparities between African-American women and white women have been attributed to the concentration of black women in "household service work and manufacturing jobs." More recent data on employment patterns among African-American women reveal a "convergence in both occupation and industry" between African-American and white women. A recent study asserts that, despite this convergence, "black women earn 7 percent less than similarly skilled white women because of their race. Even

within the same occupational category, black women earn 3 percent less than similarly qualified white women."[61(p118)] The impact of racial and gender discrimination in wages and employment begins early in the labor market experience of African-American men and women. Subsequent disparities associated with age and gender may reflect the enduring effects of initial discrimination.[62-64]

The employment gap has been attributed to lack of opportunities and institutional support, to racial discrimination, and, above all to disparities in education.[60] Earning potential is closely tied to educational attainment. A recent study[65] shows that, among men who score above the 50th percentile on standardized tests, African Americans earn almost as much as whites—on average 96% as much as white men, as compared with 66% in 1964.

To this picture, add both the risks and the barriers associated with having a physical disability. Thus, at the time of injury, African Americans are more likely to be either unemployed or in occupations that involve physical labor. They often have lower educational levels and fewer financial resources than their white counterparts. After traumatic SCI, the lack of financial resources and education remain and likely cause disparate barriers to working or integrating into the community—with the resultant lower employment rates with associated lower levels of social integration and economic self-sufficiency. In addition, people typically return to their communities, which, for many African Americans, means returning to environments that have a limited number or type of jobs available.[66,67] African Americans with SCI who are working are likely to be those who had higher levels of education at the time of injury and so are able to return to professional and administrative positions. However, even at extremely high skill levels, the disparities do not disappear but are merely reduced. Caution must be used in using education and skills to explain disparities because such a small percentage of the overall population (and an even smaller portion of African Americans in particular) work in those areas or receive those levels of education. In addition, although our study did not examine whether discrimination may have had a direct role in the hiring of African Americans after their SCI, given the historical pervasiveness of this phenomenon, discrimination in hiring may have had a significant impact on the differences that were found in the study.[68]

In short, the results of this study reflect general data on employment and confirm longstanding disparities based on race. Although, in the general population, some disparity is attributable to education and skill, controlling for these factors reveals a residual effect most scholars link to discrimination.[69] It is important to note that this discrimination is systematic—hence, disparities in skills and education are also linked to discrimination. This has profound implications in the treatments and services we provide to African Americans and other racial and ethnic minorities, if our goal is to promote QOL and community integration of all people with SCI.

CONCLUSIONS

Implications

The results of this study add to our knowledge of African Americans and the disability experience related to SCI, and they offer a substantial contribution to the literature that speaks to the specific experiences of African Americans with disabling conditions and their experiences in the disability services and the system.

There is a need for more understanding regarding the specifics of the disability experience for African Americans.[70,71] The outcomes of the rehabilitation process are not the same for African Americans with disabilities as for other groups with disabilities, but we know little about this beyond initial studies.[72,73] African Americans tend to have higher rates of disability, yet low rates of participation in vocational rehabilitation services, but there has been little research to improve understanding of this paradoxical phenomenon beyond initial work in the field.[73,74] The results of this study provide a point of departure for subsequent research that can begin to help us understand how the specific disability of SCI impacts African Americans and employment options.

As noted elsewhere,[42] state rehabilitation agencies have traditionally underserved minority populations, although recent attempts have been made to make services more culturally sensitive. However, there are many issues that arise from differences in cultural values and beliefs, and little has been done in terms of changing the organizational policy, research methodologies, and dissemination strategies, to better accommodate culturally diverse needs. Many service providers lack cultural competency, by not valuing and having in place beliefs, values, and attitudes that enable people to work effectively in a cross-cultural situation.[75] Rather than empowering consumers by working with them as partners, information or services are provided by experts to passive consumers.[76] There are no policies in place to promote cultural competency,[77] and there are not enough staff who reflect the racial, ethnic, and cultural diversity of the consumers they serve.[78,79] This is problematic because mistrust is increased if the provider does not share similar characteristics or values.[35,37] Marketing and service strategies need to be made more culturally sensitive, by adopting a more culturally specific perception of disability and dysfunction, showing respect for cultural values and beliefs, and addressing needs of families as well as the individuals.[80]

Recommendations

The findings in this study have implications for working with African Americans with SCI throughout the rehabilitation continuum to improve employment outcomes. Responsibility for both recognizing the factors associated with racial disparities and poor community integration outcomes and promoting employment falls on both the vocational rehabilitation professionals (ie, formally trained rehabilitation counselors) and the physical rehabilitation and rehabilitation medicine professional.

The formal system of vocational rehabilitation in the United States was legislated into existence beginning in 1917. Since then, the system has grown dramatically. However, serving racial and ethnic minority populations was not a focus or priority of vocational rehabilitation until the passage of the Rehabilitation Act amendments of 1992. The Rehabilitation Act amendments of 1992 issued an imperative that the rehabilitation system in the United States needed to become more effective in working with diverse clients (ie, diverse in terms of race and ethnicity).[30] The amendments did this by acknowledging (1) the rapidly changing US population profile that projects increases in minority populations, (2) that ethnic minorities have higher rates of disabling conditions (perhaps not in an absolute sense, but disproportionately so and in terms of what disabilities are reported), and (3) that state rehabilitation agencies have traditionally underserved minority populations. Furthermore, the amendments authorized the use of resources to develop procedures to increase participation in rehabilitation of underserved groups, such as persons from minority backgrounds; and it directed the federal Rehabilitation Services Administration Commissioner to develop policy for preparing more minority people for careers in rehabilitation, to eliminate some of the disparities based on race and ethnicity.[42]

Based merely on policy, the disability system should be ready to promote effective vocational rehabilitation outcomes among racial and ethnic minority populations. However, the results of this study again illustrate the disparity in employment between African Americans and whites and speak to the need for rehabilitation professionals who treat and serve persons with SCI to do more than just recognize the issue. With this in mind, we present 4 recommendations to begin the process. Although many systems may have some or all of these pieces in place, others may not yet have recognized their importance.

The first recommendation is that vocational rehabilitation should be a routine and primary aspect of the rehabilitative process for persons with SCI. Some consider vocational intervention to be an appropriate focus even during the period of medical rehabilitation.[81] Although, traditionally, vocational rehabilitation is addressed as a final phase of the physical rehabilitation process, starting it at that point can be less than successful in promoting the effective employment of persons with trauma-induced disabilities.[82] In the case of African Americans with SCI, the rehabilitation medicine team needs to acknowledge early in the physical rehabilitation period that vocational rehabilitation (ie, the achievement of a positive employment outcome) is the goal, and it must begin to take steps to support the attainment of this outcome. Although directly including vocational rehabilitation during inpatient rehabilitation is often not feasible given reduced lengths of stay, promoting the expectation that the person with SCI can and should return to work is important. The goal of eventual vocational rehabilitation, therefore, can be considered to be a "pull factor" intervention in that it can serve as a focal point, providing meaning and direction to other services.[83] Ensuring that the person with SCI is linked to a competent vocational rehabilitation provider early in the physical rehabilitation and medicine phase may do this.

A second recommendation is to ensure that persons with SCI have key roles in vocational rehabilitation decisions. The optimal vocational rehabilitation goal has to be understood not only in the context of the functional impairment resultant from the SCI, but also from what the person with SCI sees as the goal postinjury. The Rehabilitation Act of 1973[84] mandated active consumer involvement in the rehabilitation process from planning through implementation. The inherent challenge here will be ensuring the authenticity of such participation, to eliminate the tendency for the patient's role to be merely perfunctory. This can be done by actively engaging the person with SCI and family members in explicit discussion of postinjury employment options early in the physical medicine rehabilitation process. The person with SCI and family members should be invited to express their expectations about reemployment postinjury. Because many individuals (patients and family members) will be uninformed about the employment possibilities post-SCI, the rehabilitation team staff, with help from a vocational rehabilitation specialist as needed, may have to provide critically needed basic information about such topics as residual functional capacity, transferable skills analysis, and vocational evaluation. It must be considered, however, that some patients and families will be focused on coping with the traumatic nature of the SCI to the extent that they are unable to think about vocational options. Others may opt to defer early consideration of work issues amid the physical medicine rehabilitation process until they feel that physical recovery has been maximized. In such cases, the staff needs to respect the reactions and choices of the patient while providing a clear message that people with SCI of all levels of impairment can work and that they will have to consider the benefits that employment may be able to provide for them.

The third recommendation is to link the identified person with SCI and her/his family with a vocational rehabilitation agency early in the rehabilitation process, to begin the formal vocational evaluation process. A person-centered approach is favored because this is a philosophic orientation for working with persons with disabilities, which is based on embracing the values and life context (eg, family, friends, social networks) of the person with a disability.[85] This approach's reliance on the life context of the person with a disability makes it inherently milieu-based and, thus, intuitively more robust in resisting the cultural biases of other approaches. During the evaluation and placement processes, job availability and demand analyses should be conducted, to identify problems that exist in particular communities and to create strategies to get around these barriers.

The fourth recommendation is that any and all vocational rehabilitation services to persons with SCI who are African American must be delivered by a vocational rehabilitation professional who is culturally competent. Only vocational rehabilitation professionals who are culturally competent are able to align with the cultural point of view of the person with SCI and to provide services that are likely to be effective. Ideally, there would be a level of cultural awareness and sensitivity in the interdisciplinary team that works to facilitate the rehabilitation process for the person with SCI. It is most important, however, that the identified vocational rehabilitation professional have the awareness, sensitivity, and, one would hope, competence needed to work with the racial orientation of the person with the SCI.[86,87]

In summary, we suggest optimizing the possibility that the African American with SCI will achieve a successful employment outcome by advocating for and addressing a 3-point continuum for ensuring a successful vocational rehabilitation process. The first point on the continuum addresses access. Access means that the vocational rehabilitation process must be viewed as a "pull factor," allowing it to begin as an explicit process early on, to help inform the physical medicine rehabilitation process. The second point on the continuum addresses quality of the rehabilitation service. A quality rehabilitation service is one that affords the consumer's voice to be an integral part of the process through use of a person-centered planning approach, one in which the rehabilitation professionals strive to deliver culturally competent vocational services. The final point on the continuum is the outcome of the vocational rehabilitation service, that is, employment. If the first 2 points on the continuum are adequately addressed then this final point has a much greater chance of being achieved.

One additional point must be made about the implications of the results of this research. Although the value of improved clinical interventions and vocational rehabilitation strategies are critical to improving outcomes, persistent disparities that are not fully explained by lack of education or skill deficiencies pose serious challenges to those committed to closing the gap between African Americans with SCI and whites with SCI. Recent scholarship on racial disparities in employment and labor force participation rates has noted that, even in times of robust economic growth and tight labor markets, when job opportunities are greatest, the "rising tide" does not lift the boats of African Americans. The disparity results from use of informal job application networks that exclude African Americans,[88] employer belief that African Americans lack appropriate work ethics,[89] and the disappearance and downsizing of sectors of the economy that have traditionally hired African Americans or that have been located in close proximity to African-American communities.[22] These structural dimensions of employment discrimination require strategies that relocate

job opportunities or that facilitate access to where jobs are located.

Limitations of Study

As mentioned throughout, the sample and methodology impose limits on the conclusions that can be drawn from the analyses conducted in this study. Among the concerns are those about the representativeness of the sample and the cross-sectional nature of design. Clearly, there is an issue with selective attrition (eg, lost to follow-up, missing data), which is inherent when working with a national database. However, because of the large sample size, these differences are likely to be minimized. This study is also limited by the information available in the database. We were unable to assess differences in coping patterns, satisfaction with their prior level and type of employment, premorbid psychologic status, and resource availability. The existence of psychologic challenges before the SCI could have influenced scores on the psychosocial measures. Certainly, there exists a difference in access to services available, based on the region of the United States in which a person with SCI lives, which may play a significant role in employment, but this, too, could not be examined.

Suggestions for Future Research

There is much still to be learned about issues of race, employment, and SCI. Future research should explore the role of gender in a more in-depth manner to see its influence on the race dimension and whether its influence is somehow different from the influence of race on employment in this population. Another question and approach might be to look qualitatively, using focus groups and key informant interviews, at differences that may exist between African Americans and whites in basic views on the nature of disability (what is it and what interventions will maximize adjustment?) as well as views on employment. Finally, it might, of course, be very worthwhile to examine the dimensions of this study as well as the aforementioned suggested ideas for future study but by comparing other racial and ethnic minority populations, such as Native Americans, Asian Americans, Latino Americans, and Arab Americans, with white Americans.

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