Predictors of Quality of Life among Veterans with Spinal Cord Injuries Completing Multidisciplinary Rehabilitation

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No others have financial interests or relationships to disclose.
At the conclusion of this activity, the participant will be able to:

- Describe change in quality of life among Veterans undergoing multidisciplinary rehabilitation for SCI.

- Identify predictors of quality of life among Veterans at discharge from multidisciplinary rehabilitation for SCI.

- Determine whether predictors of quality of life among Veterans with SCI differ across meaningful subgroups.
SCI is a life-altering event
- Affects physical functioning, social relationships, role fulfillment, and self-perception

Initial rehabilitation is critical to help patients acquire the knowledge and skills necessary to live a satisfying life.

- Early post-injury adjustment predicts long-term adjustment to SCI.

QOL is a central goal of SCI rehabilitation.
- Assessing and predicting QOL outcomes after SCI has grown in importance.
DEFINING DISABILITY
...some history

- **1980**: International Classification of Impairments, Disabilities, and Handicaps (ICIDH):
  - **Impairment**
    - Level and completeness of SCI
  - **Disability**
    - The restriction/lack of ability to perform within “normal” ranges
  - **Handicap**
    - A disadvantage that limits/prevents the fulfillment of “normal” roles
DEFINING DISABILITY

...more recently

- **2002**: International Classification of Functioning, Disability, and Health (ICF)
  - Impairment
    - organ/body level
  - Activity Limitation
    - person level
  - Participation Restriction
    - societal level

- Disability reflects ‘dysfunctionality’ at one or more levels.
DEFINING DISABILITY

...more recently

ICF - Levels of functioning (adapted from WHO, 2002, p. 9)
Meta-Analysis: DISABILITY AND QOL

  - Disablement was defined according to 1980 ICIDH conceptualization.
- Reviewed 22 independent studies; average N =102.
- Conclusions:

<table>
<thead>
<tr>
<th>ASSOCIATIONS WITH QOL (r)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impairment: Weak, rarely statistically significant [95% CI -0.12; 0.02]</td>
</tr>
<tr>
<td>Disability: Somewhat stronger, but inconsistent [95% CI -0.27; -0.14]</td>
</tr>
<tr>
<td>Handicap: Strongest and fairly consistent [95% CI -0.48; -0.17]</td>
</tr>
</tbody>
</table>
Limitations of Existing Research.

- Meta-analysis collapsed across civilian and Veteran samples.
  - Veterans represent a disproportionate number of individuals in the US with SCI.
- Conclusions about relative predictive utility were drawn across very diverse studies.
- Cross-sectional design
- Conducted at some point after initial inpatient rehabilitation
CURRENT STUDY

* Aim 1: Describe change in QOL from pre- to post-rehabilitation.

* Aim 2: Compare indicators of impairment, activity, and participation in prospectively predicting QOL post-rehabilitation.
118 Veterans entered CARF-accredited, acute inpatient rehabilitation for SCI at the SD VA Medical Center between 1998-2010.

Rehabilitation:
- Individualized
- Lasted up to several months
- Involved many SCI-specific providers
  - Medicine, dietetics, nursing, psychology, social work, PT, OT, recreation therapy, speech therapy, etc.

IRB approval was obtained to conduct analyses.
MEASURES: QOL

* Satisfaction with Life Scale (SWLS) was completed at admission and discharge.

* Veteran’s subjective (global) assessment of his/her quality of life according to personally chosen criteria (i.e., “subjective QOL”).
  * Assesses how satisfied individuals are with their present status as compared to a standard each individual sets for him/herself.

* 5 items, each scored 1 (strongly disagree) to 7 (strongly agree).

* Possible scores ranged from 5 to 35
MEASURES: QOL

1) In most ways my life is close to my ideal.
2) The conditions of my life are excellent.
3) I am satisfied with my life.
4) So far I have gotten the important things I want in life.
5) If I could live my life over, I would change almost nothing.
MEASURES: Disablement

- **Impairment:**
  - Injury level (tetraplegia = 1; paraplegia = 0)
  - Completeness of injury (ASIA Impairment scale (A/complete = 1 to E/normal = 5))

- **Activity:** Functional Independence Measure (FIM)
  - 18 items forming 3 subscales
    - Motor, Elimination, Cognition

- **Participation:**
  - Craig Handicap Assessment and Reporting Technique (CHART)
  - 27 items forming 5 domains
    - Physical Independence, Mobility, Occupation, Social Integration, Economic Self-Sufficiency
## RESULTS: Sample Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yrs)</td>
<td>43.2 (17.5)</td>
</tr>
<tr>
<td><strong>Percent</strong></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>97.5%</td>
</tr>
<tr>
<td>Caucasian</td>
<td>65.3%</td>
</tr>
<tr>
<td>Admitted ≤ 60 days post-injury</td>
<td>80.0%</td>
</tr>
<tr>
<td>Employed for wages</td>
<td>43.2%</td>
</tr>
<tr>
<td>SU/psychiatric diagnosis</td>
<td>20.3%</td>
</tr>
<tr>
<td>Sustained SCI in combat</td>
<td>2.5%</td>
</tr>
<tr>
<td>Mechanism = MVA</td>
<td>29.7%</td>
</tr>
</tbody>
</table>
## RESULTS: Study Variables

<table>
<thead>
<tr>
<th>Impairment</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetraplegia</td>
<td>54.7%</td>
</tr>
<tr>
<td>ASIA A</td>
<td>37.9%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activity</th>
<th>M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognition</td>
<td>31.4 (3.9)</td>
</tr>
<tr>
<td>Motor</td>
<td>24.5 (13.5)</td>
</tr>
<tr>
<td>Elimination</td>
<td>4.2 (3.8)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Participation</th>
<th>M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical independence</td>
<td>98.6 (7.2)</td>
</tr>
<tr>
<td>Mobility</td>
<td>94.3 (16.9)</td>
</tr>
<tr>
<td>Occupation</td>
<td>85.4 (29.0)</td>
</tr>
<tr>
<td>Social integration</td>
<td>93.4 (16.4)</td>
</tr>
<tr>
<td>Economic self-sufficiency</td>
<td>87.2 (23.1)</td>
</tr>
</tbody>
</table>
RESULTS: Change in SWLS

* GROUP LEVEL

* $p > .10$

<table>
<thead>
<tr>
<th>SWLS</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admission</td>
<td>22.7 (7.3)</td>
</tr>
<tr>
<td>Discharge</td>
<td>21.5 (7.8)</td>
</tr>
</tbody>
</table>

* INDIVIDUAL LEVEL

* Continuous
  * Range +17 to -22 points; Individual Mean $\Delta$=+1.2 (6.0)

* Categorical (scores $\geq$20 reflect “at or above average SWL”)
  * 14% at or above average to below average
  * 17% below average to at or above average
  * 69% remained in the same category
RESULTS: Change in SWLS
# RESULTS: Predicting SWLS at Discharge

<table>
<thead>
<tr>
<th>BASELINE INDICATOR</th>
<th>SWLS AT DISCHARGE (r)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Impairment</strong></td>
<td></td>
</tr>
<tr>
<td>Injury level</td>
<td>-0.04</td>
</tr>
<tr>
<td>Injury completeness</td>
<td>-0.02</td>
</tr>
<tr>
<td><strong>Activity</strong></td>
<td></td>
</tr>
<tr>
<td>Cognition</td>
<td>0.31*</td>
</tr>
<tr>
<td>Motor</td>
<td>-0.03</td>
</tr>
<tr>
<td>Elimination</td>
<td>0.12</td>
</tr>
<tr>
<td><strong>Participation</strong></td>
<td></td>
</tr>
<tr>
<td>Physical independence</td>
<td>0.04</td>
</tr>
<tr>
<td>Mobility</td>
<td>0.09</td>
</tr>
<tr>
<td>Occupation</td>
<td>0.11</td>
</tr>
<tr>
<td>Social integration</td>
<td>0.21*</td>
</tr>
<tr>
<td>Economic self-sufficiency</td>
<td>0.16</td>
</tr>
</tbody>
</table>
RESULTS: Predicting SWLS at Discharge

Linear regression model including predictors that were statistically significant at the bivariate step.

<table>
<thead>
<tr>
<th>PREDICTOR</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admission SWLS</td>
<td>0.65*</td>
</tr>
<tr>
<td>Activity</td>
<td></td>
</tr>
<tr>
<td>Cognition</td>
<td>0.17*</td>
</tr>
<tr>
<td>Participation</td>
<td></td>
</tr>
<tr>
<td>Social integration</td>
<td>0.01</td>
</tr>
<tr>
<td>Economic self-sufficiency</td>
<td>-0.02</td>
</tr>
</tbody>
</table>

← 45%
← +2%
RESULTS: Exploratory Analyses

* Fit of the FIM cognition (activity) predictor did not vary by meaningful subgroups...
  * Age median split
  * Tetraplegia vs. Paraplegia
RECAP OF FINDINGS

- Marked variability was observed across individuals in the magnitude and direction of QOL changes.

- Activity (cognition) and participation (social integration, economic self-sufficiency) predicted QOL at discharge.
  - Consistent with 1997 meta-analysis findings that disability and handicap were the strongest predictors of QOL.

- When entered jointly, activity (cognition) emerged as the most robust predictor.
  - In contrast to 1997 meta-analysis findings that handicap was most consistently associated with QOL.
Cognitive Impairment

- Cognitive screening is a standard component of acute SCI rehabilitation at the VA Medical Center.
- Veterans referred for cognitive rehabilitation to reduce functional interference as indicated.
- Cognitive assessment and rehabilitation tools must be flexible and incorporate modifications for SCI populations.
GRAND SCHEME OF THINGS.

**Social Integration**

- Programs providing assistance in building new and/or mobilizing existing social support resources.
- Support groups and peer-mentor programs encourage Veterans to integrate with others who are coping with similar adjustment difficulties.
- Consistent with large body of research indicating the importance of social networks in health.
Importance of Early Adjustment

- Directly targeting various aspects of emotional well-being, including perceived QOL
  - Rehabilitation Psychology 2011 Systematic Review
    - Supported the use of specialized CBT protocols in persons with SCI experiencing depression, anxiety, and adjustment/coping difficulties.
- Telecounseling interventions
  - Increase access, time-efficiency, and cost-effectiveness
  - Valuable method for reaching pts with limited mobility
  - Shown to improve QOL, coping skills, community integration, and depression in individuals with SCI and other acquired physical disabilities.
Limitations

- Findings pertain to a particular definition/measure of (subjective) QOL – life satisfaction
- What about adjustment after inpatient rehabilitation?
- Limitations of predictor and outcome measures
- Focused narrowly on components of disablement
IN CLOSING

- First investigation of the relative utility of impairment, activity, and participation in predicting QOL among Veterans completing acute rehabilitation for SCI.

- Findings highlight potential targets for interventions aiming to improve QOL post-SCI among US Veterans.

- Results suggest that rehabilitation settings should continue (or expand upon) programs targeting cognitive functioning and social integration.
THANK YOU!

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