Reviewer ID: Nicole Elfring/Brodie Sakakibara, John Zhu, Jeremy Mak

Type of Outcome Measure: WHOQOL-BREF

<table>
<thead>
<tr>
<th>Author ID Year</th>
<th>Study Design</th>
<th>Setting</th>
<th>Population (sample size, age) and Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chan &amp; Chan 2006</td>
<td>Cross-sectional; used Hong Kong version of WHOQOL-BREF</td>
<td>Hong Kong</td>
<td>N=31 (25 male, 6 female) Mean Age: 41.68±11.17 9 high tetraplegia (C1-C4) 8 low tetraplegia (C5-C8) 8 high paraplegia (T1-T9) 6 low paraplegia (T10-S)</td>
</tr>
<tr>
<td>Chapin 2004</td>
<td>Cross-sectional; concurrent and factorial validity explored</td>
<td>Canadian Paraplegic Association</td>
<td>N =132 Mean age = 45.82 Paraplegic SCI</td>
</tr>
<tr>
<td>Jang 2004</td>
<td>Cross-sectional validation study using multi-trait analysis and known-groups methods</td>
<td>Community and hospital, Taiwan</td>
<td>N = 111 (SCI) &amp; 169 (non-SCI) SCI mean age = 40 ±13 years Non-SCI mean age = 37 ±12 years SCI participants: Complete tetraplegia = 23 Incomplete tetraplegia = 28 Complete paraplegia = 43 Incomplete paraplegia = 17</td>
</tr>
<tr>
<td>Lin et al. 2007</td>
<td>Cross-sectional; Telephone interviews to compare the psychometric performance of the WHOQOL with the SF-36</td>
<td>Subjects were identified from a nationwide registry of 809 traumatic SCI cases in Taiwan</td>
<td>N=187 (151 men) Mean Age = 50.3 years Mean time since injury = 7.4 years 48 incomplete tetraplegia 28 complete tetraplegia 73 incomplete paraplegia 38 complete paraplegia</td>
</tr>
<tr>
<td>Miller et al. 2008</td>
<td>Cross-sectional, confirmatory factor analysis</td>
<td>4 chapters (Alberta, Saskatchewan, Nova Scotia and Manitoba) of the Canadian Paraplegic Association</td>
<td>161 SCI subjects (77% male) mean age: 46.88±15.52 yrs</td>
</tr>
<tr>
<td>Suttiwong et al. 2013</td>
<td>Cross-sectional validation of Thai version of IPAQ</td>
<td>Thai community</td>
<td>N=139, 110M 29F Mean age 34.2±8.4 Mean time after injury 10.6±7.1yrs 49 quadriplegia, 90 paraplegia 137 (or more) were traumatic SCIs Wheelchair as primary mobility tool</td>
</tr>
</tbody>
</table>

1. RELIABILITY

<table>
<thead>
<tr>
<th>Author ID</th>
<th>Internal Consistency</th>
<th>Test-retest, Inter-rater, Intra-rater</th>
</tr>
</thead>
</table>

### Jang Y 2004

**Cronbach’s α:**
- Physical Health Domain: 0.75
- Psychological Domain: 0.74
- Social Relationship Domain: 0.54
- Environment Domain: 0.78

**No data available**

### Lin et al., 2007

**Cronbach’s α:**
- Overall QOL & General Health: 0.79
- Physical Health Domain: 0.87
- Psychological Domain: 0.83
- Social Relationship Domain: 0.75
- Environment Domain: 0.86

10 subjects were contacted for re-assessment by same initial interviewer within 2 weeks.

**Test-retest (intra-rater) reliability:**
- Overall QOL and General Health: ICC=0.84
- Physical Health Domain: ICC=0.93
- Psychological Domain: ICC=0.98
- Social Relationship Domain: ICC=0.84
- Environment Domain: ICC=0.89

10 subjects were contacted for re-assessment by different initial interviewer within 2 weeks.

**Test-retest (inter-rater) reliability:**
- Overall QOL and General Health: ICC=0.63
- Physical Health Domain: ICC=0.88
- Psychological Health Domain: ICC=0.95
- Social Relationship Domain: ICC=0.56
- Environment Domain: ICC=0.80

### Miller et al. 2008

**Cronbach’s α:**
- Physical Health Domain: 0.82
- Psychological Domain: 0.82
- Social Relationship Domain: 0.74
- Environment Domain: 0.80

**No data available**

### 2. VALIDITY

**Author ID** | **Validity**
--- | ---
Jang Y 2004 | Item scale correlation structure showed that all facets\(^a\) had the highest correlations with the domain\(^b\) to which they were originally assigned by the WHOQOL group.

Analysis by t-test of the WHOQOL-Bref scale and subscales to examine differences between different groups completing the WHOQOL-Bref

- Overall QOL facet: \(t=4.94\)\(^{**}\)
- Overall General Health facet: \(t=10.85\)\(^{**}\)
- Physical Health Domain\(^b\): \(t=13.23\)\(^{**}\)
- Psychological Domain: \(t=6.91\)\(^{**}\)
- Social Relationship Domain: \(t=5.92\)\(^{**}\)
- Environment Domain: \(t=2.31\)\(^*\)
- \(^{**}\)P<.001; \(^*\)P=.022

\(^a\)Facet defined as an aspect of life contributing to QOL, each item (26 total) represents one facet

\(^b\)Domain defined as a collection of related items, therefore also a collection of facets

When controlling for gender, education, and employment status, all facet and domain scores were influenced by the SCI and non-SCI group except the environment domain (\(t=0.86, P=.389\))

### Chapin M. 2004

**Sense of Well-Being Inventory (SWBI) and WHOQOL-BREF Pearson correlations:**

- SWBI Psychological and WHOQOL-BREF psychological domain: \(r=0.75\)
SWBI Physical and WHOQOL-BREF physical health domain: r=0.63
SWBI Family/social and WHOQOL-BREF social relationships domain: r=0.63
SWBI Financial/Environment and WHOQOL-BREF environment domain: r=0.59

Correlations between the WHOQOL-BREF (HK) domains and the Chinese Version of Quebec User Evaluation with Assistive Technology (C-QUEST):

**C-QUEST Devices domain with WHOQOL-BREF:**
- Overall QOL and General Health*: r=0.412, P<0.05
- Physical Health Domain: r=0.508, P<0.05
- Psychological Domain**: r=0.344, P=0.056
- Social Relationships Domain: r=0.460, P<0.05
- Environment Domain: r=0.567, P<0.05

The Device scores were positively and moderately correlated with the domain scores of the WHOQOL-BREF (HK), except the psychological health domain, which has a marginal correlation with the Device score.

**C-QUEST Services domain with WHOQOL-BREF:**
- Overall QOL and General Health*: r=0.120, P>0.05
- Physical Health Domain: r=0.307, P>0.05
- Psychological Domain**: r=0.023, P>0.05
- Social Relationships Domain: r=0.242, P>0.05
- Environment Domain: r=0.333, P>0.05

The Service scores are not significantly associated with the score on the WHOQOL-BREF (HK), P>0.05.

*2 items regarding overall QOL and general health
**2 extra Hong Kong-specific items

Correlations between the WHOQOL-Bref subscales and the SF-36 subscales measuring the same constructs:
The rho of the conceptually related domains between the WHOQOL-BREF and the SF-36 (overall QoL & general health-general health; Physical Capacity-Physical Functioning/Role physical/bodily pain; Psychological well-being-social functioning/role emotional/mental health; social relationships-social functioning) are higher than 0.4, with the exception of the WHOQOL-BREF’s Psychological Well-Being and the SF-36’s Role Emotional (rho = 0.37)
The rho of the rating scale with the domains of the WHOQOL-BREF were all greater than 0.4 All P<.0001

The ability of the WHOQOL-BREF to discriminate among subgroups with respect to age, education, marital status, employment, time since injury, level of injury, and self-care ability was tested using the Mann-Whitney U-test.
Overall, the WHOQOL-BREF domains significantly discriminated between subgroups in terms of 4 characteristics**.

*Overall QOL and General Health, Physical Health Domain, Psychological Domain, Social Relationships Domain, Environment Domain
**Marital status, employment status, level of injury, self-care ability (all domains P≤0.05)

Income was positively related to WHOQOL-BREF domains:
- Physical health (r=.24, P<0.01)
- Social relationships (r=.24, P<0.01)
- Environmental (r=.40, P<0.01)

Education was positively related to WHOQOL-BREF domains:
- Physical health (r=.20, P<0.05)
- Psychological (r=.19, P<0.05)
- Social relationships (r=.18, P<0.05)
- Environmental (r=.28, P<0.01)

Time since injury is positively related to WHOQOL-BREF domains:
Self-esteem, as measured by the *Rosenberg Self-Esteem Scale*, is positively related to WHOQOL-BREF domains:
- Physical health \((r=.54, P<0.01)\)
- Psychological \((r=.62, P<0.01)\)
- Social relationships \((r=.41, P<0.01)\)
- Environmental \((r=.43, P<0.01)\)

Acceptance of disability, as measured by the *Acceptance of Disability Scale*, is positively related to WHOQOL-BREF domains:
- Physical health \((r=.72, P<0.01)\)
- Psychological \((r=.51, P<0.01)\)
- Environmental \((r=.46, P<0.05)\)

<table>
<thead>
<tr>
<th>Author ID</th>
<th>Spearman’s (r) of WHOQOL-BREF** (Thai) subscales with Impact on Participation and Autonomy Questionnaire (Thai, IPAQ) subdomains (N=30):</th>
</tr>
</thead>
</table>
| Lin et al. 2007 | WHOQOL Physical:  
Autonomy Indoors = -0.56*  
Family role = -0.55*  
Autonomy outdoors = -0.49*  
Social life and relationships = -0.39*  
Work and education = -0.37  

WHOQOL Psychosocial:  
Autonomy Indoors = -0.46*  
Family role = -0.55*  
Autonomy outdoors = -0.59*  
Social life and relationships = -0.34  
Work and education = -0.37*  

WHOQOL Social Relation:  
Autonomy Indoors = -0.44*  
Family role = -0.47*  
Autonomy outdoors = -0.65*  
Social life and relationships = -0.40*  
Work and education = -0.33  

WHOQOL Environmental:  
Autonomy Indoors = -0.30  
Family role = -0.36*  
Autonomy outdoors = -0.59*  
Social life and relationships = -0.33  
Work and education = -0.35  

*Indicates significant correlations. Statistical significance was not defined in article.  
**Raw domain scores instead of transformed domain scores used for correlations

### 3. RESPONSIVENESS

<table>
<thead>
<tr>
<th>Author ID</th>
<th>Subjects who are employed and who are unemployed after SCI (all employed before SCI) were interviewed for a second time to recall their health related QoL at the time of the injury:</th>
</tr>
</thead>
</table>
| Lin et al. 2007 | Effect Sizes of WHOQOL-BREF:  
Overall QOL and general health domain (combined for this study): 1.01 |
4. FLOOR/CEILING EFFECT

<table>
<thead>
<tr>
<th>Author ID</th>
<th>Floor/ceiling effect</th>
</tr>
</thead>
</table>
| Jang et al. 2004 | Floor Effect (number of patients scored minimally): n (%)  
Overall QOL facet: 6 (5.4)  
General Health facet: 10 (9.0)  
Physical Health Domain: 0 (0.0)  
Psychological Health Domain: 0 (0.0)  
Social Relationship Domain: 0 (0.0)  
Environment Domain: 0 (0.0)  

Ceiling Effect (number of patients scored maximally): n (%)  
Overall QOL facet: 1 (0.9)  
General Health facet: 2 (1.8)  
Physical Health Domain: 1 (0.9)  
Psychological Health Domain: 1 (0.9)  
Social Relationship Domain: 0 (0.0)  
Environment Domain: 0 (0.0) |
| Lin et al. 2007 | Floor Effect (number of patients scored minimally): n (%)  
Overall QOL and general health Domain: 2 (1.3)  
Physical Health Domain: 7 (0)  
Psychological Health Domain: 6 (0.0)  
Social Relationship Domain: 3 (0.0)  
Environment Domain: 8 (0.4)  

Ceiling Effect (number of patients scored maximally): n (%)  
Overall QOL and general health Domain: 2 (0.4)  
Physical Health Domain: 7 (0.0)  
Psychological Health Domain: 6 (0.0)  
Social Relationship Domain: 3 (0.4)  
Environment Domain: 8 (0.0) |

5. INTERPRETABILITY

<table>
<thead>
<tr>
<th>Author ID</th>
<th>SEM, MDC, MCID, normative and published data</th>
</tr>
</thead>
</table>
| Jang et al. 2004 | N = 111 SCI (mean age = 40 (13) years) & 169 non-SCI (mean age = 37 (12) years)  
| Facet and Domain: | Non-SCI | SCI |  
| Overall QOL Item | 13.92 (2.69) | 12.14 (3.28) |  
| General health Item | 14.22 (2.72) | 10.16 (3.27) |  
| Physical health Domain | 15.44 (1.84) | 11.41 (2.84) |  
| Psychological Domain | 13.75 (2.12) | 11.74 (2.73) |  
| Social relationships Domain | 14.25 (2.21) | 12.54 (2.58) |  
| Environment Domain | 12.85 (2.13) | 12.18 (2.55) |  

This study used a different scoring scheme, in which domain scores are the means of their respective item scores, which are then multiplied by 4. Domain scores ranges from 4 to 20. |
| Chan & Chan 2006 | N=31 (25 male, 6 female) Mean Age: 41.68±11.17  
<p>| Domain | Mean (SD) score: |<br />
| Overall QOL/General Health Items | 56.00 (16.57) |</p>
<table>
<thead>
<tr>
<th>Domain</th>
<th>Mean (SD) score:</th>
<th>SEM</th>
<th>MDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall QOL/General Health Items</td>
<td>52.4 (19.4)</td>
<td>7.8</td>
<td>21.5</td>
</tr>
<tr>
<td>Physical health Domain</td>
<td>56.1 (19.6)</td>
<td>5.2</td>
<td>14.4</td>
</tr>
<tr>
<td>Psychological Domain</td>
<td>53.7 (16.9)</td>
<td>2.4</td>
<td>6.6</td>
</tr>
<tr>
<td>Social relationships Domain</td>
<td>58.9 (16.1)</td>
<td>6.4</td>
<td>17.9</td>
</tr>
<tr>
<td>Environment Domain</td>
<td>53.1 (15.3)</td>
<td>5.1</td>
<td>14.1</td>
</tr>
</tbody>
</table>

Lin et al. 2007

N=187 (151 men), Mean Age = 50.3 years, 121 incomplete, 111 paraplegia
Mean (SD) scores for each WHOQOL-Bref domain and SEM, MDC calculated from data in Lin et al. 2007: