Reviewer ID: Tyra Chu, Carlos L. Cano Herrera, Ben Mortenson

Last updated: February 9th, 2024

Research Summary – Short-Form Quadriplegia Index of Function – Short-form (QIF-SF) – Self Care and Daily Living

Author Year Research Design Setting (country)	Demographics and Injury Characteristics of Sample	Validity	Reliability	Responsiveness Interpretability
Angerhöfer et al. 2023 Psychometric study to demonstrate the psychometric properties and sensitivity of the Berlin Bimanual Test for Tetraplegia (BeBiTT) University Hospital of Tübingen, the Charité-Universitätsmedizin Berlin, and the Neurological Rehabilitation	N = 14 participants with tetraplegia 13M, 1F Mean (SD) age 48.6 (18.5) years Completeness of injury: A (n = 6), B-C (n = 8)	**Construct Validity:** BeBiTT baseline scores and QIF-SF scores were positively correlated, r(14) = 0.66, p = 0.011.		

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Clinic Beelitz-Heilstätten (Germany)				
Snoek et al. 2005 Survey Two specialized spinal cord injury centers in the Netherlands	N=47 (38M, 9F) Mean age (SD): 42(13) Mean duration of injury (SD): 11 (9) Mean general health (SD): 2.7 (0.8)** Mean quality of life (SD): 2.8 (0.7)** **scores range from 1 (perfect) to 5 (poor) 44% AIS A 31% AIS B 9% AIS C 16% AIS D	Correlation between QIF-SF scores and health state related to upper-extremity impairment of subjects with tetraplegia: Spearman's r=0.313 (p=0.03)		**Interpretability:** For best motor level complete lesions C6 and above (n=23): Mean score (SD): 9.9 (6.9) For best motor level incomplete lesions C6 and above (n=24): Mean score (SD): 19 (6.1)
Marino & Goin 1999 Cross-sectional design collected	N=95 (85M, 10F) Mean (SD) age: 31.2 (13.2); range from 16-68 years	The short form QIF has progression of scores by motor level and motor score. Mean score increased with each motor level,	**Internal Consistency:** α = 0.89 Item-total correlations for the short-form QIF	**Interpretability:** Mean (SD) short-form QIF scores by best motor level group: See table 1.

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at 6 months post SCI Regional Spinal Cord Injury Center	Tetraplegia, non-ambulatory at 6 months.	except C7 & C8, which were similar (by Fisher's least significant-difference test). Mean motor scores were different for all groups except groups (21-30 & 31-40) Upper Extremity Motor Score (UEMS) & short-form QIF (ρ = 0.824) <u>Short-form QIF items & QIF score</u> Wash/dry hair: (r=0.784, ρ = 0.758) Turn supine to side in bed: (r=0.825, ρ =0.844) Put on lower body clothing: (r=0.794, ρ =0.700) Open carton/jar: (r=0.772, ρ =0.730)	ranged from 0.60-0.80.	

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<table>
<tr><th>Author Year Research Design Setting (country)</th><th>Demographics and Injury Characteristics of Sample</th><th>Validity</th><th>Reliability</th><th>Responsiveness Interpretability</th></tr>
<tr><td></td><td></td><td>Transfer from bed to chair: (r=0.879, ρ =0.845)
Lock wheelchair: (r=0.722, ρ =0.830)

Short-form QIF: (r=0.987, ρ =0.978)

Regression analysis of individual items to predict 37-item QIF score explained 99% of variance in total scores.</td><td></td><td></td></tr>
<tr><td></td><td colspan="4">Table 1.
<table>
<tr><th rowspan="2">Best motor level</th><th colspan="2">Total group (n=95)</th><th colspan="2">Frankel A or B (n=76)</th></tr>
<tr><th>N</th><th>Mean (SD)</th><th>N</th><th>Mean (SD)</th></tr>
<tr><td>C4/5</td><td>33</td><td>2.5 (4.4)</td><td>30</td><td>2.2 (3.9)</td></tr>
<tr><td>C6</td><td>25</td><td>7.4 (6.5)</td><td>20</td><td>6.5 (6.0)</td></tr>
<tr><td>C7</td><td>19</td><td>13.6 (6.7)</td><td>11</td><td>11.5 (6.1)</td></tr>
<tr><td>C8</td><td>7</td><td>13.1 (7.0)</td><td>6</td><td>14.7 (6.3)</td></tr>
<tr><td>T1+</td><td>11</td><td>21.0 (4.9)</td><td>9</td><td>21.0 (5.4)</td></tr>
</table></td></tr>
</table>

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Spooren et al. 2006 Longitudinal cohort study to assess responsiveness of tools to changes in arm hand skilled performance. SCI Units in 8 rehabilitation centres in the Netherlands	N= 60 (46M, 14F) Mean age = 38.9 C3-C6 = 42 C7-T1 = 18 AIS A-B = 34 AIS C-D = 26			**Responsiveness:** *t=time t1-t3 = from start of rehab to discharge t1-t2 = from start of rehab to 3 months later t2-t3 = from 3 months after the start of rehab to discharge. For the interpretation of SRM and ES, a value of 0.20 was considered small, a value between 0.50 and 0.80 was moderate and > 0.80 was large degree of responsiveness. **Total QIF**: there was a significant difference in the QIF scores across the three measurements (Friedman, P<0.000*). There was a

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				significant difference between all time intervals (Wilcoxon; P<0.000) *Possible error in article but it consistently says P<0.000 throughout SRM_{QIF3-1} = 1.43 SRM_{QIF2-1} = 1.13 SRM_{QIF3-2} = 0.74 ES_{QIF3-1} = 2.18 ES_{QIF2-1} = 1.38 ES_{QIF3-2} = 0.40 **Groups A-B and C-D:** There was a significant difference across the three measurements for both groups (Friedman, P<.001). There were significant differences between all time intervals (Wilcoxon, P<.002) **Group A-B**

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				SRM_{QIF3-1} = 1.15 SRM_{QIF2-1} = 0.87 SRM_{QIF3-2} = 0.73 ES_{QIF3-1} = 2.81 ES_{QIF2-1} = 1.59 ES_{QIF3-2} = 0.52 **Group C-D** SRM_{QIF3-1} = 2.03 SRM_{QIF2-1} = 1.61 SRM_{QIF3-2} = 0.79 ES_{QIF3-1} = 2.04 ES_{QIF2-1} = 1.57 ES_{QIF3-2} = 0.35 **Groups C3-C6 and C7-T1:** There was a significant difference across the three measurements for both groups (Friedman, P<.001). There were significant differences between all time intervals (Wilcoxon, P<.003) **Group C3-C6**

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				$SRM_{QIF3\text{-}1}$ = 1.33 $SRM_{QIF2\text{-}1}$ = 1.03 $SRM_{QIF3\text{-}2}$ = 0.80 $ES_{QIF3\text{-}1}$ = 1.61 $ES_{QIF2\text{-}1}$ = 1.05 $ES_{QIF3\text{-}2}$ = 0.34 **Group C7-T1** $SRM_{QIF3\text{-}1}$ = 2.08 $SRM_{QIF2\text{-}1}$ = 1.52 $SRM_{QIF3\text{-}2}$ = 0.73 $ES_{QIF3\text{-}1}$ = 3.26 $ES_{QIF2\text{-}1}$ = 2.22 $ES_{QIF3\text{-}2}$ = 0.60