Reviewer ID: Elsa Sun, Carlos L. Cano

Last updated: May 8th, 2024

Research Summary – Wheelchair Outcome Measure (WhOM) – Wheeled Mobility

Author Year Research Design Setting (country)	Demographics and Injury Characteristics of Sample	Validity	Reliability	Responsiveness Interpretability
Miller et al. (2011) Canada Prospective test re-test study Community	N=50 (42M, 8F) Mean age 43.7 (10.7) Mean time since SCI: 16.1 (10.1) years Tetraplegic = 64% Manual Wheelchair = 66%	Spearman's Correlation Coefficients for WhOM Satisfaction and Satisfaction x Importance scores with selected LIFE-H items. (Miller et al., 2011; N=50, 42 male) Please see Table 1 below. Low to High correlation with Assessment of Life Habits (LIFE-H): Spearman's ρ = 0.18-0.62 (WhOM mean satisfaction with LIFE-H subscales; 9/16 correlations with ρ≥0.50, P<0.01) Spearman's ρ = 0.16-0.55 (WhOM mean	**Test-retest reliability ICCs:** The ICCs for all WhOM scores exceeded 0.80. The test-retest intraclass correlation coefficients (ICC2, 2) for the WhOM satisfaction (Sat) and WhOM importance (Impt)_Sat scores were 0.83 (95% confidence interval (CI), 0.72–0.90) and 0.88 (95% CI, 0.79–0.93), respectively. The inter-rater ICC for the WhOM Sat and WhOM Impt_Sat scores were 0.91 (95% CI, 0.85–0.95) and 0.90 (95% CI, 0.83–0.94), respectively.	**Minimal Detectable Change** Mean Satisfaction: 1.19-1.61 Mean Satisfaction x Importance: 15.02-16.27 **Standard Error of Measurement**: Mean Satisfaction: 0.43-0.58 Mean Satisfaction x Importance: 5.42-5.87

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<table>
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<tr><td></td><td></td><td>satisfaction weighted by Importance, with LIFE-H subscales; 4/16 correlations with ρ≥0.50, P<0.01)</td><td>Test re-test agreements were high (ICC2,1: 0.90) and inter-rater agreements were high (ICC2,2: 0.90). Substantial agreement between raters for identified participation outcomes was achieved (K> 0.71).</td><td></td></tr>
<tr><td></td><td colspan="4">Table 1
<table>
<tr><td>LIFE-H Areas</td><td>LIFE-H Items</td><td>N</td><td>WhOM MeanSat</td><td>WhOM MeanImpt x Sat</td></tr>
<tr><td>Community Life</td><td>Getting to Public Buildings in your community</td><td>46</td><td>0.53**</td><td>0.44**</td></tr>
<tr><td></td><td>Entering/getting around public buildings in your community</td><td>46</td><td>0.37*</td><td>0.30*</td></tr>
<tr><td></td><td>Getting to commercial establishments in your community</td><td>48</td><td>0.51**</td><td>0.42**</td></tr>
</table></td></tr>
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		Entering and moving around in commercial establishments in your community	48	0.42**	0.36*
		Participating in social or community groups	47	0.37*	0.28
	Employment	Taking part in unpaid activities (volunteering)	37	0.50**	0.52**
		Getting to your principal place of occupation	30	0.47**	0.40*
		Entering and moving around in your principal place of occupation	30	0.62**	0.55**
	Fitness	Participating in physical activities for physical fitness	34	0.55**	0.45*
		Participating in relaxation, unwinding activities for well-being	32	0.51**	0.30*
	Recreation	Participating in sporting or recreational activities	33	0.55**	0.41*
		Going to sporting events	30	0.56**	0.54**
		Going to artistic or cultural events	41	0.18	0.16

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<tr><td></td><td colspan="4"><table>
<tr><td></td><td>Participating in tourist activities</td><td>35</td><td>0.27</td><td>0.21</td></tr>
<tr><td></td><td>Taking part in outdoor activities</td><td>30</td><td>0.52**</td><td>0.38*</td></tr>
<tr><td></td><td>Using your neighborhood recreational services</td><td>33</td><td>0.29</td><td>0.53**</td></tr>
</table>**P<0.01; *P<0.05</td></tr>
<tr><td>Auger et al. (2010)

Canada

Test-retest (reliability and telephone administration) and Cross-sectional (construct validity)</td><td>Power Mobility Users aged 50-89 years.
Two independent cohorts were recruited: 1) a prospective cohort (n=40) to estimate test-retest reliability and to determine the applicability of the telephone format, and 2) a cross-sectional cohort to examine construct validity with 3 groups: i) people waiting for a first power mobility device (n=44); ii) new users (n=35;1–6 months), and</td><td>The validity testing showed moderate correlations with the Quebec User Evaluation of Satisfaction with Technology (QUEST 2.0, rS=.36–.45) and the Psychosocial Impact of Assistive Devices Scale (PIADS-10, rS=31–.43).
WhOM scores could discriminate users based on duration of use (p<.001) and device type (power wheelchair vs scooter, p<.05).</td><td>Internal Consistency
Cronbach’s Alpha for each of the 19-item pain and difficulty dimensions and for the complete 38-item questionnaire.

Pain α=0.98, Difficulty α=0.96, complete α=0.97.

Pearson’s correlation coefficient for inter-item correlations. High correlations between several of the pain and difficulty items (r=0.633 to</td><td></td></tr>
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	iii) long-term users (n=39;12–18 months	The convergent validity analyses estimated moderate coefficients ranging from 0.36 to 0.46 between all QUEST scores and mean WhOM scores (MeanIMP × SAT and MeanSAT). Adequate correlation with Québec User Evaluation of Satisfaction with Assistive Technology (QUEST): Spearman's ρ = 0.45 (Mean Satisfaction with QUEST total; P<0.001) Spearman's ρ = 0.37 (Mean Satisfaction weighted by Importance with QUEST total; P<0.001)	0.891). All correlations were significant at P<.0001. The "difficulty" index was eliminated along with 4 items that measured similar motions and had sufficiently high inter-item correlations (r>0.85), leaving a 15-item instrument. The internal consistency was unchanged from the original value of α=0.97. **Test-retest** The tool demonstrated good test-retest reliability (intraclass correlation coefficient 0.77-1.00), took 10.9 min (standard deviation = 5.2) to administer and	

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		(Auger et al., 2010; N=116, 47 male; Power mobility device users, unknown if sample includes SCI individuals)	was practical to use over the telephone.	
Garden (2009) Canada Prospective test re-test study	N = 50 (84%M, 16%F) Mean age was 43.7 years (SD=10.7, range 20 - 66). Tetraplegia = 64% Manual wheelchair = 66% Mean length of time using a wheelchair was 5.7 + 4.7 years.	The subscale of assistive device scale of the Quebec User Evaluation of Satisfaction with Assistive Technology (QUEST) demonstrated a positive relationship with the WhOM (r > 0.65). Items on the Assessment of Life Habits (LIFE-H) demonstrated a positive relationship with the WhOM (r ranged from 0.51 – 0.62). Both the Psychosocial Impact of Assistive Devices Scale and the Return to Normal Living Index	**Test re-test**: Test re-test agreements were high (ICC2,1: 0.90) and inter-rater agreements were high (ICC2,2: 0.90). Substantial agreement between raters for identified participation outcomes was achieved (K> 0.71).	

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		failed to meet the hypothesis (r > 0.50). Construct validity was supported by moderate associations (.33<r<.66) with a generic participation measure, as well as with satisfaction with assistive technologies.		

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Research Summary – Wheelchair Outcome Measure (WhOM) – Wheeled Mobility - Cross-cultural Validation Studies

Author Year Research Design Setting (country)	Demographics and Injury Characteristics of Sample	Validity	Reliability	Responsiveness Interpretability
Alimohammad et al. (2016) Validation of Farsi version of the WhOM Farsi Validation	N=75 Farsi speakers, wheelchair as primary mobility device Mean (SD) time post-SCI = 60 (61) months)	**Construct validity** Construct validity was assessed by measuring associations between scores of the WhOM-Farsi, the 12-item short-form health survey (SF-12), the Beck Depression Index (BDI-II) and the Spinal Cord Independence Measure (SCIM-III). Significant correlations, in the direction anticipated, were found between more than half of the WhOM-Farsi scores and other measurement scores (BDI-II, SF-12 and SCIM-III) (Table 4). The magnitude of the	**Inter-rater reliability** The intra class correlation coefficient (ICC) for inter-rater reliability for all scores was 0.99. For test-retest, the ICC was 0.91, 0.94 and 0.83 for Sat, Imp Sat and body function, respectively	

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		associations between the Mean Sat, Mean Imp Sat, body function scores and other measurements scores (SF-12, SCIM III, BDI-II), did not reach what we hypothesized (r ! 0.35). The only exceptions were positive correlations of Mean Sat home, Mean Imp Sat home Total and Mean Imp Sat with SCIM-III and also the negative correlation between Mean Imp Sat community and BDI-II (r > 0.35).		