Reviewer ID: Tyra Chu, Carlos L. Cano Herrera, William Miller

Last updated: February 20th, 2024

Research Summary – Fatigue Severity Scale (FSS) – Mental Health

Author Year Research Design Setting (country)	Demographics and Injury Characteristics of Sample	Validity	Reliability	Responsiveness Interpretability
Craig et al. 2015 Prospective longitudinal design 3 SCI units in Sydney, Australia	N=88 (62M, 26F) Mean age (SD): 42.6 (17.8) Duration of SCI in weeks (SD): 7.3 (6.1) 39% Tetraplegic, 61% Paraplegic Inclusion criteria: • Acute SCI sustained • First-time admission to a SCI unit • 18-80 years of age at time of interview • able to speak English	Odds Ratio (95% CI) = 1.69 (1.09-2.29) X^2 = 3.23 p-value = 0.07		
Menon et al. 2015	N=127 (35F, 92M) Age: 32.71 ±13.08 Time Since Injury (days): 76.22 ± 82.5	Change in FSS and change in SCIM III Spearman's rho: 0.283 (p=0.031, significant)		

Author Year Research Design Setting (country)	Demographics and Injury Characteristics of Sample	Validity	Reliability	Responsiveness Interpretability
Prospective descriptive study Research hospital in India	Myelopathy patients Admission AIS: AIS A: 58 AIS B: 18 AIS C: 36 AIS D: 11 Discharge AIS: AIS A: 47 AIS B: 16 AIS C: 26 AIS D: 34			
[Anton et al.](#) 2008 2-week methodologic study to assess the internal consistency, reliability and construct validity of the FSS.	N=48 Male=31 Female=17 Mean age=40.4 Mean time since injury=14.9 years Major cause of injury=motor vehicle collision=27 Motor complete SCI=48	Pearson correlation FSS convergent with: Visual Analog Scale for Fatigue (VAS-F) r=0.67 Centre for Epidemiologic Studies Depression Scale (CES-D) r=0.58 divergent with	**Internal consistency:** Cronbach α=0.89 **Test-retest, Intra-rater, Inter-rater:** ICC=0.84 Items (ICC) 1=0.32 2=0.42 3=0.51	**Interpretability:** Mean (SD) values for Total and Individual FSS Items Item: / Mean (SD) FSS Score: 1 / 5.7 (1.6) 2 / 3.8 (1.7) 3 / 4.1 (1.8) 4 / 4.7 (1.9)

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A tertiary spinal cord rehab facility in Vancouver, Canada.	Tetraplegia=26 ASIA grade A injuries=30	Short Form-36 (SF-36) r=-0.48 Assuming an FSS cut-score of 4 to indicate significant fatigue and a VAS-F score of over 6 to indicate severe fatigue.. Sensitivity=75% Specificity=67% The diagnostic values for a cut-score of 5 improved the specificity at the expense of sensitivity. Area under the ROC=0.799	4=0.73 5=0.77 6=0.74 7=0.70 8=0.75 9=0.74	<table><tr><td>5</td><td>4.0 (1.7)</td></tr><tr><td>6</td><td>4.1 (1.9)</td></tr><tr><td>7</td><td>4.2 (1.9)</td></tr><tr><td>8</td><td>4.1 (2.0)</td></tr><tr><td>9</td><td>4.3 (2.1)</td></tr><tr><td>Total</td><td>4.4 (1.4)</td></tr></table> SEM for total FSS (calculated from data in article): 0.56 MDC for total FSS (calculated from data in article): 1.55	

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Research Summary – Fatigue Severity Scale (FSS) – Mental Health – Cross-cultural Validation Studies

Author Year Research Design Setting (country)	Demographics and Injury Characteristics of Sample	Validity	Reliability	Responsiveness Interpretability
Sobreira et al. 2021 Observational prospective study to determine the MCIDs for the FSS, among others OMs Two rehabilitation centers in Portugal	N = 57 patients with SCI with a mean intervention time of 7.3 (1.7) weeks mean (SD) age was 54.5 (15.9) years 36M, 24F Level of injury: Cervical (n = 31), thoracic (n = 19), lumbar (n = 10) ASIA impairment scale classification: A (n = 13), B (n = 7), C (n = 11), D (n = 29) Mean (SD) time since injury 5.5 (1.468) months The NPRS, PCF, PEF, FSS, and LCADL were collected at baseline and discharge. On average their rehabilitation program lasted 7.3 (1.7) weeks.	Moderately correlated with the Visual Analogue Scale for Fatigue: r=0.74		**MCID:** Non-significant improvement was found for FSS (median difference of −0.1; P = .33; ES = −0.09. - Distribution-based methods: Distribution-based MCID estimates ranged from 0.6 to 1.7 points for the FSS. - Pooled MCID Estimates for Clinical Measures: The weighted MCID estimates was 1.1 points on the FSS.

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Author Year Research Design Setting (country)	Demographics and Injury Characteristics of Sample	Validity	Reliability	Responsiveness Interpretability
[Gavrilov et al.](#) 2018 Russian version Russia	N=85 MS patients Mean age: 37.6±10.2 years 32 Male, 53 Female	Convergent Validity of FSS with: (FIS – Fatigue Impact Scale) $FIS_{cognitive}$: $r=0.35$, $P=0.001$ $FIS_{physical}$: $r=0.82$, $P<0.001$ $FIS_{psychosocial}$: $r=0.75$, $P<0.001$ Discriminant Validity of FSS with: BMI (Body mass index): $r = -0.08$, $P = 0.14$ ESS (Epworth Sleepiness Scale): $r = 0.183$, $P = 0.09$	**Internal consistency:** Cronbach $\alpha=0.88$-0.96 Individual items showed a high correlation (Pearson's $r > 0.60$) to the total score. **Test-retest, Intra-rater, Inter-rater:** Test-retest reliability ICC=0.78-0.89	**Floor/ceiling effect:** Floor = 2.4% Ceiling = 0.9% **Interpretability:** See table 1.

Table 1.

	Control subjects (n=250)	MS patients (n=85)	P
FSS	3.4 ± 1.4	4.1 ± 1.6	<0.001
95% CI	3.23–3.59	3.83-4.52	
Fatigue (FSS ≥ 4.0)	87 (34.8%)	45 (52.9%)	0.005