

**Research Summary – Spinal Cord Injury – Falls Concern Scale (SCI-FCS) – Community Reintegration**

Author Year Research Design Setting (country)	Demographics and Injury Characteristics of Sample	Validity	Reliability	Responsiveness Interpretability
<p><a href="#">Boswell-Ruys et al.</a> 2010</p> <p>Observational Study and Cross-Sectional Survey</p> <p>Community and hospitals, Australia.</p>	<p>Demographic data presented as mean (SD) unless otherwise</p> <p><b>All Participants:</b> N = 125 with SCI Used wheelchair for at least 75% of their mobility needs Age (years): 41 (14) Male:female (ratio): 101:24 Time since injury (years): 9 (12) ASIA motor score: 51 (12) ASIA sensory score: 123 (44) ASIA classification A:B:C:D (number): 77:30:13:5</p> <p><b>Test-retest reliability subgroup:</b></p>	<p><b>Development:</b> 22 health professionals (physiotherapists, occupational therapists, rehabilitation nurses and physicians) experienced with SCI were consulted to select appropriate activities. Group 1 (n=14) nominated a list of activities to include in the scale. Group 2 (n=8) agreed with 60%.</p> <p>Activities with &gt;75% agreement were included in the scale. Five additional activities were selected from the list by SCI experts to add</p>	<p><b>Internal Consistency:</b> Cronbach's <math>\alpha</math> = 0.92</p> <p>Addition of activities sequentially increased Cronbach's <math>\alpha</math> from 0.63 to 0.92 Removal of one activity at a time (with replacement) did not result in a Cronbach's <math>\alpha</math> &lt; 0.91.</p> <p>Mean inter-activity correlations = 0.42 (range 0.10–0.77)</p> <p><b>Test-retest, Inter-rater, Intra-rater:</b> Test-retest reliability with mean (SD) interval of 3.5 (1.4) days:</p>	

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	N= 20 Age (years): 42 (13) Male:female (ratio):14:6 Time since injury (years): 15 (15) ASIA motor score: 50 (16) ASIA sensory score: 124 (45) ASIA classification A:B:C:D (number): 10:7:2:1	more physically challenging activities.  <b>Construct Validity</b> See table 1.	ICC = 0.93 (95% CI: 0.84–0.97)																																									
<table><tr><th colspan="4">Table 1.</th></tr><tr><th>Characteristic</th><th>Group 1</th><th>Group 2</th><th>Mean (95% CI) between-group difference (on total SCI-FCS scores)</th></tr><tr><td>Age</td><td>Under 40</td><td>40 and over</td><td>0 (-4 to 4)</td></tr><tr><td>Level of injury</td><td>T6 and above</td><td>Below T6</td><td>8 (4–12)*</td></tr><tr><td>Time since injury</td><td>Acute (&lt;1 year)</td><td>Chronic (&gt;1 year)</td><td>4 (1–8)</td></tr><tr><td>Falls per year</td><td>One or less</td><td>Greater than one</td><td>6 (2–10)*</td></tr><tr><td>Vertical transfer</td><td>Independent</td><td>Dependent</td><td>7 (3–11)*</td></tr><tr><td>Self-reported fear of falling</td><td>Absent</td><td>Present</td><td>7 (3–11)*</td></tr><tr><td>Supported sitting ability</td><td>Very good to excellent</td><td>Poor to good</td><td>9 (6–12)*</td></tr><tr><td>Unsupported sitting ability</td><td>Good to excellent</td><td>Fair to poor</td><td>9 (6–12)*</td></tr></table> <p>*Significant mean between-group difference at the level of P&lt;0.05. These significant associations indicate that SCI-FCS has good construct validity.</p>					Table 1.				Characteristic	Group 1	Group 2	Mean (95% CI) between-group difference (on total SCI-FCS scores)	Age	Under 40	40 and over	0 (-4 to 4)	Level of injury	T6 and above	Below T6	8 (4–12)*	Time since injury	Acute (<1 year)	Chronic (>1 year)	4 (1–8)	Falls per year	One or less	Greater than one	6 (2–10)*	Vertical transfer	Independent	Dependent	7 (3–11)*	Self-reported fear of falling	Absent	Present	7 (3–11)*	Supported sitting ability	Very good to excellent	Poor to good	9 (6–12)*	Unsupported sitting ability	Good to excellent	Fair to poor	9 (6–12)*
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**Research Summary – Spinal Cord Injury – Falls Concern Scale (SCI-FCS) – Community Reintegration - Cross-cultural Validation Studies**

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<a href="#">Basak &amp; Duman</a> 2024  Methodological study  Turkish version   Physical Therapy and Rehabilitation Hospital in Turkey	N = 134 participants with SCI 95M, 39F Mean (SD) age 39.26 (14.47) years Injury level: C5-C7 (n = 13), T1-T6 (n = 28), T7- T12 (n = 79), L1-L5 (n = 14) Mean (SD) injury duration 55.94 (74.42)	<p><b>Content validity:</b> The content validity index (CVI) was 1.0 for each item.</p> <p><b>Construct validity:</b> All the standardized regression coefficients (factor loads) of the single-factor measurement model established with 16 items in the SCI-FCS, which is single-factor in its original version, are above 0.84 (<math>p &lt; 0.05</math>). The variance rates (error variances) that the structure could not explain in the items range between 0.06 and 0.29 (indicating that the</p>	<p>The correlation values of the 16 items in the SCI-FCS scale with the overall scale are 0.72 and above. These obtained values suggest that the items work consistently with the overall scale.</p> <p>The Cronbach's alpha (<math>\alpha</math>) reliability value is 0.97.</p> <p>The test-retest reliability coefficient value is ICC = 0.81.</p>	

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		<p>unexplained variances are quite low).</p> <p><b>Criterion validity:</b> There is a statistically significant positive correlation between the scores the participants obtained from the SCI-FCS scale and the scores they obtained from the Falls Efficacy Scale-International (FES-I) scale (<math>r = 0.97</math>; <math>p &lt; 0.01</math>).</p>		
<p><a href="#">Galante-Maia et al.</a> 2021</p> <p>Psychometric study Brazilian Portuguese version</p> <p>SARAH Network of Rehabilitation</p>	<p>130 participants were enrolled, being 30 in phase I (translation and cross-culturally adaptation of the SCI-FCS) and 100 in phase II (measurement properties of the adapted version).</p> <p><b>Phase I:</b> N = 30</p>	<p><b>Construct validity (Rasch analysis):</b> Rasch analysis reliability index was 0.81 and 0.98 and the separation index was 2.10 and 6.25 for the persons and items, respectively. Both items and persons fitted the statistics model's expectations,</p>	<p><b>Internal consistency:</b> Cronbach's <math>\alpha = 0.95</math></p> <p><b>Test-retest reliability of the total scores:</b> Excellent (ICC = 0.92; 95%CI, 0.86–0.95).</p> <p>Test-retest reliability of the individual</p>	

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Hospitals, Belo Horizonte, Brazil	<p>23M, 7F Mean (SD) age 36 (12) years Cause of SCI: Traumatic (n = 25), non-traumatic (n = 5) Level of injury: Cervical (n = 10), T1-T6 (n = 6), T7-T12 (n = 12), lumbar (n = 0), not reported (n = 2) Mean (SD) time since injury 4 (7) years</p> <p><b>Phase II:</b> N = 100 75M, 25F Mean (SD) age 37 (14) years Cause of SCI: Traumatic (n = 84), non-traumatic (n = 16) Level of injury: Cervical (n = 34), T1-T6 (n = 19), T7-T12 (n = 43), lumbar (n = 4), not reported (n = 0)</p>	ensuring its unidimensionality.	items showed substantial to almost perfect agreement in 14 of the 16 items (Kappa coefficients ranging from 0.67 to 0.87; 95% CI, 0.40–1.0). Item 3 (“Inserting enema or toileting using a bath chair, if necessary”) showed moderate agreement (k = 0.56; 95% CI, 0.25–0.86) and item 11 (“pushing wheelchair or being pushed on a flat ground”), showed poor agreement (k = 0.04; 95% CI, 0.01–0.42).	

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	Mean (SD) time since injury 4.2 (5.7) years			
<a href="#">Pramodhyakul &amp; Pramodhyakul</a> 2020  Translation and adaptation study <b>Thai version</b>  A tertiary rehabilitation center in Thailand	N = 54 participants with SCI 44M, 10F Mean (SD) age 31.8 (9.5) years Level of injury: Tetraplegia (n = 2), paraplegia (n = 52) Severities of injury: AIS A (n = 32), AIS B (n = 9), AIS C (n = 11), AIS D (n = 2) Mean (SD) time since injury 10.7 (7.2) years	<b>Content validity (Index of item-objective congruence [IOC]):</b> After synthesis and cross adaptation, the IOC was 1.0.	<b>Internal Consistency:</b> Cronbach's $\alpha$ = 0.88.  <b>Test-retest reliability</b> was excellent (ICC = 0.99; $P < 0.001$ for total scores) and ranged from 0.98 to 1 for each item.	The items that scored the highest were Item 13: pushing wheelchair up/down gutters or curbs, Item 14: pushing wheelchair up/down a slope, and Item 12: pushing wheelchair on an uneven surface (e.g., rocky ground, irregular pavement).
<a href="#">Marquez et al.</a> 2018  Psychometrics study <b>Italian version</b>  Multicenter study in spinal units in	N=124 Mean age: $46.2 \pm 15.0$ years 100 Male (81%) 93 Paraplegic 61 Complete Paraplegic 31 Tetraplegic 21 Complete Tetraplegic	Pearson's correlation coefficient of SCI-FCS-I with total score of WheelCon-M-I-short form = 0.56 ( $p < 0.01$ )	<b>Internal Consistency:</b> Cronbach's $\alpha$ = 0.82 ( $p < 0.01$ )  <b>Test-retest, Inter-rater, Intra-rater:</b> Inter-rater reliability: ICC=0.972	

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Northern and Southern Italy	35 Acute spinal cord injury  AIS: 82A, 25B, 15C, 2D		Test-retest reliability: ICC=0.973, >0.7 (range of ICC values, 0.765-1.0) in each item	
<a href="#">Butler Forslund et al. 2016</a>  Translation, adaptation and validation study of <b>Swedish</b> <b>version</b> of SCI- FCS Cross-Sectional  Rehab Station Stockholm/Spin alis, Sweden	N = 87 (65 males) with traumatic SCI Used wheelchair for at least 75% of their mobility needs Median age = 49 years (range 18–79) Median years since injury =15 (range 2–52)  Neurological level: Cervical = 45 Thoracic 1-6 = 17 Thoracic 7-2 = 20 Lumbar = 5  ASIA Impairment Scale: A = 53 B = 19	Individuals with shorter time since injury, who answered 'yes' to the question on fear of falling, reported higher values on the Hospital Anxiety and Depression Scale, Fatigue Severity Scale or Secondary Conditions Scale, and were unable to get up from the ground unaided reported a higher total score on the SCI-FCS (Significant at $P<0.05$ )  All other comparisons were non-significant.	<b>Internal Consistency:</b> Cronbach's $\alpha$ = 0.95	<b>Floor/ceiling effect:</b> Thirteen participants (16%) scored the lowest possible (16/64), while only one scored the maximum (64/64)  <b>Interpretability:</b> Median SCI-FCS score = 21 (range 16–64)  Lower scores indicated fewer fall concerns.

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	C = 9 D = 6			
<a href="#">Roaldsen et al.</a> 2015  Translation, adaptation and test-retest study of <b>Norwegian</b> <b>version</b> of SCI- FCS  Specialized rehabilitation setting in Norway	<p>N = 54 with SCI, used wheelchair for at least 75% of their mobility needs</p> <p>Median age in years (Q1-Q3; min-max) = 49 (33–62; 20–92)</p> <p>Sex = 45 Men (83%)</p> <p>Median time since injury in years (Q1-Q3; min-max) = 13 (6–30; 1–58) Complete or incomplete SCI: Complete SCI n = 30 (56%)</p> <p>Level of injury - n (%): C1-C8 = 21 (39) T1-T6 = 10 (19) T7-T12 = 18 (33) L1-S4/5 = 5 (9)</p>		<p><b>Internal Consistency:</b> Cronbach's <math>\alpha</math> = 0.88</p> <p><b>Test-retest, Intra-rater, Inter-rater:</b> Test-retest reliability with one week interval: ICC = 0.83</p> <p>The degree of agreement between item scores at test and retest using percentage agreement (PA):</p> <p>A satisfactory PA (<math>\geq 70\%</math>) was noted for all 16 items except for item 12 (propelling wheelchair/being pushed on uneven,</p>	<p><b>Responsiveness:</b> SEM = 2.6 (12%)</p> <p><b>Floor/ceiling effect:</b> No ceiling effect reported</p> <p>7% of the individuals at Time 1 and 15% at Time 2 (1 week apart) scored the lowest total score (16 points) scored the maximum (64/64)</p> <p><b>Interpretability:</b> Median SCI-FCS score = 21 (range: 16–46)</p> <p>Lower scores indicated fewer fall concerns.</p> <p>MDC = 7.1 (32%)</p>



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	<p>Median ASIA motor score (Q1-Q3;min-max) = 50 (32–57; 2–91)</p> <p>AIS classification – n (%):</p> <p>A = 31 (57)</p> <p>B = 6 (11)</p> <p>C = 9 (17)</p> <p>D = 8 (15)</p> <p>Education – n (%):</p> <p>Primary school = 3 (6)</p> <p>Secondary school = 6 (11)</p> <p>High school = 24 (44)</p> <p>University College/ University = 21 (39)</p> <p>Falls last year: Yes n = 41 (76%)</p> <p>Number of falls last year - n (%):</p> <p>0 = 13 (24)</p>		<p>snowy or icy surface), which was just below the satisfactory level (69%).</p>	

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	1 = 16 (30) >1 = 25 (46)			