Spinal Cord Independence Measure III, IV, and Self-reported (SCIM-III, SCIM-IV, SCIM-SR)

Assessment Overview

Assessment Area

ICF Domain:
Activity
Subcategory:
Self-care
Subscales:
Self-care
Respiration & Sphincter Mgmt.
Mobility

You Will Need

Length:
30 minutes by observation or 10-15 minutes by interview; SCIM III and SCIM III-SR have 17 items (Q2 and Q3 have 2 parts, so there are 19 questions to answer); SCIM IV has 16 items
Scoring:
Items scores ranges from 0-2 to 0-15. Subscale scores and total scores are the sums of the respective items.
Higher scores indicate higher independence in performing ADLs.

Summary

The Spinal Cord Independence Measure (SCIM) is a clinician-administered scale that measures the independence level of people with SCI when performing basic activities of daily living (e.g., dressing, grooming, feeding, transferring).

The SCIM assesses 3 areas of daily living tasks: Self-Care, Respiration and Sphincter Management, and Mobility (including toileting). Clinicians score the SCIM based on their observations of patients' performance and the range of assistance required (from Total Assistance to No Assistance/Fully Independent).

The most studied version of the SCIM is the third version (SCIM-III), which has extensive data supporting its use, as well as high clinical relevance for the rehabilitation of people with SCI.
Minimal staff/patient burden is required as the variables collected are important to patient care and are routinely collected as a component of standard practice.

A self-report version of SCIM (SCIM-SR) is also available and is comparable to the observation-based SCIM in reliability and validity. Since the SCIM-SR does not require task observation, it generally takes less time to complete.

Availability

Available for free in p.13-15 of the SCIM Toolkit here:
https://scireproject.com/wp-content/uploads/2024/06/SCIM_Toolkit2024_digital.pdf

Languages:

- SCIM-III: English, Italian, Chinese, Korean, Persian, Greek, Thai, Turkish, Brazilian, Spanish
- SCIM-SR: English, Nepali, Thai, Chinese, Swedish, Italian, Spanish

Assessment Interpretability

Minimal Clinically Important Difference

Total:	4.20
Self-Care:	1.15
Resp. Sphinct. Mgmt.:	1.82
Mobility Rm. & Toilet:	0.61
Mobility In/Outdoors:	1.21

(Scivoletto et al. 2013; N=255; 199 males; traumatic or ischemic SCI, 157 paraplegia, ASIA: 97A, 40B, 52C, 66D; mean (SD) time since injury: 51.6(36.8) days)

Statistical Error

Minimal Detectable Change:

Total:	8.20
Self-Care:	2.64
Resp. Sphinct. Mgmt.:	6.07
Mobility Rm. & Toilet:	1.59
Mobility In/Outdoors:	1.96

(Scivoletto et al. 2013; N=255; 199 males; traumatic or ischemic SCI, 157 paraplegia, ASIA: 97A, 40B, 52C, 66D; mean (SD) time since injury: 51.6(36.8) days)

Typical Values

Median Admission/Discharge SCIM Total Scores (by Injury Level):

C1-C4: 19.0/19.0
C5: 21.5/23.5
C6: 25.5/34.5
C7-8: 39.5/50.0
T1-T6: 53.5/63.0
T7-T12: 61.0/66.0

(Ackerman et al. 2010; N=114 (92M, 22F); AIS A: 91 AIS B: 23; C1-4: 13; C5: 16; C6: 18; C7-8: 12; T1-6: 38; T7-12: 17)

Measurement Properties

Validity – Moderate to High

High correlation between SCIM III and Functional Independence Measure (FIM):

r = 0.80-0.84

(Bluvshtein et al. 2011; N=261; male/female ratio = 5:2; 55% tetraplegia, 45% paraplegia; ASIA A-D; study conducted between admission and discharge of rehabilitation)

(Anderson et al. 2011; N=390; 294 males; 187 tetraplegia, 203 paraplegia; ASIA: 135A, 54B, 80C, 121D; inpatient, mean (SD) age at injury: 45.3(17.9))

High correlation between SCIM III and Modified Barthel Index:

r = 0.88

(Xing et al. 2021; N=102; 64M, 38F; Mean (SD) age 48.8 (15.6) years; 50 Tetraplegia, 52 paraplegia; AIS A=19,), B =24, C = 8, D =51; Median (IQR) time since injury 2 (1.0-6.8) months)

Moderate to High Sensitivity (correctly identifying true positives) and Specificity (correctly identifying true negatives) for 10 bilateral muscle predictors from UEMS and GRASP-MMT predicting SCIM-III:

SCIM-Self-care at 6 months: Sensitivity = 86.4% (66.7-95.3%), Specificity = 89.2% (75.3-95.7%)

SCIM-Mobility at 6 months: Sensitivity = 92% (75.0-97.8%), Specificity = 91.2% (77.0-96.7%)

(Velstra et al. 2016; N=61, 45 male; Mean age 47, SD = 19 Acute (16-40 days after injury) tetraplegia at recruitment 58/61 traumatic SCI; AIS at 1 month: A=16, B=10, C=7, D=28)

High correlation between SCIM III and SCIM III-SR:

ρ = 0.87-0.95

(Fekete et al. 2013; N=99; 26 females, 73 males; median age: 48 years; complete and incomplete injuries)

Reliability – High

High Inter-rater Reliability:

SCIM III, Pearson's r = 0.81-0.95

(Anderson et al. 2011; N=390; 294 males; 187 tetraplegia, 203 paraplegia; ASIA: 135A, 54B, 80C, 121D; inpatient, mean (SD) age at injury: 45.3(17.9))

(Itzkovich et al. 2007; N=425; 309 males, 116 females; 188 tetraplegia, 237 paraplegia; study conducted between admission and discharge of rehabilitation)

SCIM III, ICC = 0.948-0.977

(Itzkovich et al. 2007; N=425; 309 males, 116 females; 188 tetraplegia, 237 paraplegia; study conducted between admission and discharge of rehabilitation)

SCIM III-SR, ρ = 0.88; ICC = 0.98

(SCIM III-SR Chinese version; Wang et al. 2021; N=147; 120 males, 27 females; mean (SD) age 40.3 (12.9) years; 45 tetraplegia, 102 paraplegia; ASIA A-D)

(SCIM III-SR Swedish version; Jörgensen et al. 2021; N=42 peer mentors; 30 males, 18 females; mean (SD) age: 44.5 (30) years; 25 tetraplegia, 23 paraplegia; 17 complete injuries, 30 incomplete injuries)

SCIM IV, ICC > 0.90

(Catz et al. 2022; N=648; 476 males, 172 females; mean (SD) age 49 (17) years; level of injury: C1-L5; ASIA A-D)

High Internal Consistency:

SCIM III, α = 0.83-0.89

(Anderson et al. 2011; N=390; 294 males; 187 tetraplegia, 203 paraplegia; ASIA: 135A, 54B, 80C, 121D; inpatient, mean (SD) age at injury: 45.3(17.9))

(Itzkovich et al. 2007; N=425; 309 males, 116 females; 188 tetraplegia, 237 paraplegia; study conducted between admission and discharge of rehabilitation)

SCIM IV, α = 0.63-0.93

High correlation between SCIM III and SCIM IV:

r = 0.89 – 0.99

(Catz et al. 2024; N=648; 476 males, 172 females; mean (SD) age 49 (17) years; level of injury: C1-L5; ASIA A-D)

Number of studies reporting validity data: 24

(Catz et al. 2022; N=648; 476 males, 172 females; mean (SD) age 49 (17) years; level of injury: C1-L5; ASIA A-D)

SCIM-SR, α = 0.80-0.98

(Wang et al. 2021; N=147; 120 males, 27 females; mean (SD) age 40.3 (12.9) years; 45 tetraplegia, 102 paraplegia; ASIA A-D)

Number of studies reporting reliability data: 25

Responsiveness

Floor/Ceiling Effect:

A floor effect (>50% of participants scoring minimum at admission) was observed in 13 of 19 skills for the C1-C4 subgroup (as well as for the C5 subgroup for skills that required greater upper extremity musculature).

Ceiling effects (≥50% of participants scoring maximum at admission) were observed in:

- Feeding & grooming (T1-12)
- Respiration (C5-8, T1-12)
- Bed mobility (T7-12)

(Ackerman et al. 2010; N=114; 92 males, 22 females; ASIA A-B; level of injury: cervical-thoracic; ≤ 12 months post-SCI)

Floor effect evident for “transfer ground/wheelchair” item (62%)

(Glass et al. 2009; N=86; 72 males, 14 females; 40 tetraplegia, 46 paraplegia; ASIA A-D; inpatient)

Effect Size:

Self-care subscale (Standardized Response Mean scores):

Between 1 and 12 months post-enrollment: SRM = 1.28

Between 6 and 12 months post-enrollment: SRM = 0.42

(Velstra et al. 2015; N=74; 51 males; cervical SCI; ASIA A-D; ≤ 10 days post-SCI at enrollment; study conducted over 1-year post-SCI)

Number of studies reporting responsiveness data: 16