Transfer Assessment Instrument (TAI)

Assessment Overview

Assessment Area

ICF Domain:

Activity and Participation

Subcategory:

Mobility

You Will Need

Length:
Part 1 has 17 items, part 2 has 12 items – 5-10 minutes
Scoring:
Each item in part 1 is answered "yes" (1 point), "no" (0 points), or "N/A" (item removed from calculation). Each item in part 2 is scales from 0 ("strongly disagree") to 4 ("strongly agree") or "N/A" (item removed from calculation). The part 1 score is multiplied by 10 and divided by the number of items, the part 2 score is multiplied by 2.5 and divided by the number of items. The part 1 and part 2 scores are then summed and divided by 2.

Summary

The Transfer Assessment Instrument (TAI) is used to determine how effective a patient is at a transfer and how well the patient follows transfer techniques.

Part 1 of the TAI determines whether or not the patient follows each individual component of transfer technique. Part 2 of the TAI determines the extent to which the patient's transfer was effective in terms of position of weight bearing arm, set up phase, conservation, and quality. The tool can be used to the assess the transfers of any full-time wheelchair user.

The TAI has been updated to version 4.0; which can be administered remotely. Further, a self-assessment questionnaire (TAI-Q) has been developed from TAI 4.0 (scores range from 0-100).

Availability

Worksheets:

- TAI 3.0 and TAI 4.0 can be found for free here: http://www.upmc-sci.pitt.edu/node/933
- TAI-Q: Can be found here.

Assessment Interpretability

Minimal Clinically Important Difference

TAI 3.0 Intrarater **MDC**: 1.55
TAI 2.0 Intrarater **MDC**: 1.38
TAI 3.0 Interrater **MDC**: 1.53
TAI 2.0 Interrater **MDC**: 1.51
(Tsai et al. 2013; n=41 wheelchair users; 31 males, 10 females; mean (SD) age: 49.9 (12.7); 8 tetraplegia, 7 high paraplegia, 14 low paraplegia)

TAI 4.0 **MDC**:
Session 1 = 0.68; Session 2 = 0.63
(Worobey et al. 2018; n=44 wheelchair users (30 with SCI); 35 males, 9 females; mean (SD) age: 56.5 (12.7))

Total score remote assessment = 1.23; Wheelchair setup remote assessment = 1.15; Body setup remote assessment = 2.22; Flight/landing remote assessment = 2.44
(Worobey et al. 2022; n=44; wheelchair users (30 with SCI); 35 males, 9 females; mean (SD) age: 56.5 (12.7) years; 20 paraplegia, 2 tetraplegia; mean (SD) time since injury: 17.4 (11.4) years)

TAI-Q (self-assessment) **MDC**:
Session 1 pre-video = 2.21; Session 1 post-video = 1.97; Session 2 = 1.63
(Worobey et al. 2020; n=44; wheelchair users (30 with SCI); 35 males, 9 females; mean (SD) age: 56.5 (12.7) years; 20 paraplegia, 2 tetraplegia; mean (SD) time since injury: 17.4 (11.4) years)

Remote Home-based/self-assessment TAI **MDC**:
1.04-2.20
(Abou et al. 2023; n=18 manual wheelchair users with SCI; 12 males, 6 females; mean (SD) age: 41.1 (14.2); injury level: cervical – lumbar; and mean (SD) time since injury: 7.8 (32.6) years)

Statistical Error

TAI 3.0 Intrarater **SEM**: 0.56
TAI 2.0 Intrarater **SEM**: 0.50
TAI 3.0 Interrater **SEM**: 0.55
TAI 2.0 Interrater **SEM**: 0.54
(Tsai et al. 2013; n=41 wheelchair users; 31 males, 10 females; mean (SD) age: 49.9 (12.7); 8 tetraplegia, 7 high paraplegia, 14 low paraplegia)

TAI 4.0 **SEM**:
Session 1 = 0.24; Session 2 = 0.23
(Worobey et al. 2018; n=44 wheelchair users (30 with SCI); 35 males, 9 females; mean (SD) age: 56.5 (12.7))

Total score remote assessment = 0.44; Wheelchair setup remote assessment = 0.42; Body setup remote assessment = 0.80; Flight/landing remote assessment = 0.88
(Worobey et al. 2022; n=44; wheelchair users (30 with SCI); 35 males, 9 females; mean (SD) age: 56.5 (12.7) years; 20 paraplegia, 2 tetraplegia; mean (SD) time since injury: 17.4 (11.4) years)

TAI-Q (self-assessment) **SEM:**
Session 1 pre-video = 0.80; Session 1 post-video = 0.71; Session 2 = 0.59
(Worobey et al. 2020; n=44; wheelchair users (30 with SCI); 35 males, 9 females; mean (SD) age: 56.5 (12.7) years; 20 paraplegia, 2 tetraplegia; mean (SD) time since injury: 17.4 (11.4) years)

Remote Home-based/self assessment TAI **SEM**:
0.38-0.79
(Abou et al. 2023; n=18 manual wheelchair users with SCI; 12 males, 6 females; mean (SD) age: 41.1 (14.2); injury level: cervical – lumbar; and mean (SD) time since injury: 7.8 (32.6) years)

Typical Values

Mean Transfer Assessment Scores (±SD):
Part 1: 7.04 (±1.44)
Part 2: 7.55 (±1.61)
Total: 7.30 (±1.42)

(Tsai et al. 2013; n=41 wheelchair users; 31 males, 10 females; mean (SD) age: 49.9 (12.7); 8 tetraplegia, 7 high paraplegia, 14 low paraplegia)

TAI-Q (self-assessment):

- TAI-Q total mean score for session 1 pre-video review: 7.1 (1.0)
- TAI-Q total mean score for session 1 post-video review: 7.3 (1.0)
- TAI-Q total mean score for session 2: 7.3 (1.1)

(Worobey et al. 2020; n=44; wheelchair users (30 with SCI); 35 males, 9 females; mean (SD) age: 56.5 (12.7) years; 20 paraplegia, 2 tetraplegia; mean (SD) time since injury: 17.4 (11.4) years)

TAI 4.0:

- TAI total mean score in-person: 7.56 (1.01) and remote: 7.70 (1.05)
- TAI wheelchair setup mean score in-person: 6.73 (2.14) and remote: 6.77 (2.10)
- TAI body setup mean score in-person: 7.69 (1.44) and remote: 7.78 (1.50)
- TAI flight/landing mean score in-person: 8.83 (2.14) and remote: 9.46 (1.24)

(Worobey et al. 2022; n=44; wheelchair users (30 with SCI); 35 males, 9 females; mean (SD) age: 56.5 (12.7) years; 20 paraplegia, 2 tetraplegia; mean (SD) time since injury: 17.4 (11.4) years)

Measurement Properties

Validity – Low to High

Low to Moderate correlation of TAI scores for each rater with global assessment of transfer skills:

Rater 1: r = 0.279

Rater 2: r = 0.192

Rater 3: r = 0.690

(McClure et al. 2011; n=40 full-time wheelchair users (32 with SCI); 34 males, 6 females; mean (SD) age : 51.7 (11.3) years)

Low Significance in differences in final TAI scores amongst subgroups with tetraplegia, high paraplegia and low paraplegia:

P = 0.21

(Tsai et al. 2013; n=41 wheelchair users; 31 males, 10 females; mean (SD) age: 49.9 (12.7); 8 tetraplegia, 7 high paraplegia, 14 low paraplegia)

High correlation with the visual analog score (VAS) across all transfers:

Rater 1: r = 0.89

Rater 2: r = 0.89

Rater 3: r = 0.88

Rater 4: r = 0.90

(Baghel et al. 2018; N=30 manual wheelchair users; 25 males, 5 females; mean (SD) age: 31.9 (12.3) years)

TAI-Q (self-assessment): Moderate correlation with TAI 4.0 for session 1 pre-video (ICC = 0.41) and High correlation for session 2 post-video (ICC = 0.78)

(Worobey et al. 2020; n=44; wheelchair users (30 with SCI); 35 males, 9 females; mean (SD) age: 56.5 (12.7) years; 20 paraplegia, 2 tetraplegia; mean (SD) time since injury: 17.4 (11.4) years)

Number of studies reporting validity data: 4

Reliability – Moderate to High

Moderate to High Inter-rater reliability:

ICC session 1: 0.80-0.85

ICC session 2: 0.84-0.85

ICC Transfer 1 (remote TAI 4.0): 0.830

ICC Home-based/remote assessment TAI: 0.57-0.90

Moderate to High Intra-rater reliability:

ICC rater 1: 0.69-0.78

ICC rater 2: 0.76-0.84

ICC rater 3: 0.60-0.88

ICC Session 1 post-video vs Session 2 post video (TAI-Q): 0.627

ICC Transfer 1 vs 2 (remote TAI 4.0): 0.687

ICC Home-based/remote assessment TAI: 0.90

Moderate to High Test-restest reliability:

ICC rater 1: 0.70

ICC rater 2: 0.76

ICC rater 3: 0.55

ICC rater 4: 0.60

ICC Session 1 post-video vs Session 3 post-video (TAI-Q): 0.705

ICC Transfer 1 vs Transfer 3 (remote TAI 4.0): 0.721

(Tsai et al. 2013; n=41 wheelchair users; 31 males, 10 females; mean (SD) age: 49.9 (12.7); 8 tetraplegia, 7 high paraplegia, 14 low paraplegia)

(Worobey et al. 2018; n=44 wheelchair users (30 with SCI); 35 males, 9 females; mean (SD) age: 56.5 (12.7))

(Worobey et al. 2020; n=44; wheelchair users (30 with SCI); 35 males, 9 females; mean (SD) age: 56.5 (12.7) years; 20 paraplegia, 2 tetraplegia; mean (SD) time since injury: 17.4 (11.4) years)

(Worobey et al. 2022; n=44; wheelchair users (30 with SCI); 35 males, 9 females; mean (SD) age: 56.5 (12.7) years; 20 paraplegia, 2 tetraplegia; mean (SD) time since injury: 17.4 (11.4) years)

(Baghel et al. 2018; N=30 manual wheelchair users; 25 males, 5 females; mean (SD) age: 31.9 (12.3) years)

(McClure et al. 2011; n=40 full-time wheelchair users (32 with SCI); 34 males, 6 females; mean (SD) age : 51.7 (11.3) years)

(Abou et al. 2023; n=18 manual wheelchair users with SCI; 12 males, 6 females; mean (SD) age: 41.1 (14.2); injury level: cervical – lumbar; and mean (SD) time since injury: 7.8 (32.6) years)

Number of studies reporting reliability data: 6

Responsiveness

Floor/Ceiling Effect:

Three items (items 9 and 15 in part 1 and item 7 in part 2) had a potential ceiling effect.

(McClure et al. 2011; n=40 full-time wheelchair users (32 with SCI); 34 males, 6 females; mean (SD) age : 51.7 (11.3) years)

Effect Size:

Not established in SCI

Number of studies reporting responsiveness data: 3