

Abstract

Objective: A pilot to determine consumer preference in ranking walking function utilizing the Walking Index for Spinal Cord Injury (WISCI). And, to determine if this consumer ranking differs from professionals who ranked the WISCI according to impairment.

Design: Blinded hierarchical rank ordering

Methods: Photographs were taken depicting each defined WISCI level (21 photos in all) using the same person and a similar background in order to ensure uniformity of the pictures other than the defined differences in the WISCI levels. The pictures were printed out on a color laser printer on a half sheet of paper with the written WISCI descriptors at the bottom of each photo. The photographs were randomly shuffled. Sixteen individuals with chronic motor incomplete spinal cord injury (11 cervical, 2 thoracic, 3 lumbar) met one-on-one with the research coordinator and were asked to place the pictures in rank order by their individual preference for walking. The responses of each participant were entered into an excel spreadsheet for analysis.

Results: Fifty percent (50%) of the consumers ranked the WISCI levels requiring physical assistance as a lower preference than those levels not requiring physical assistance. Twenty-five percent (25%) of the consumers ranked the stability of a walker higher than crutches. These differed from the professionals who were instructed to rank subjects from most impaired to least impaired based on the theoretical construct of the WISCI scale (Ditunno et al. 2000, Ditunno 2001).

Conclusion: Consumers preference for recovery of walking function differed from professionals. Minimal clinical significance for recovery of walking function may need to be investigated differentially for professionals and consumers since the differences may reflect bias or the intent of the measure.

Introduction

Recovery of walking function is important to individuals with motor incomplete spinal cord injury (SCI).¹ The Walking Index for Spinal Cord Injury (WISCI) scale has been validated in a number of studies²⁻⁷ and has been accepted as one of two capacity measures by the European Clinical Trials Group. The hierarchical ranking has been validated by the Delphi method among an international group of SCI therapists, clinicians and researchers and demonstrated construct and face validity.^{2,3} It subsequently was compared to 4 other scales in a clinical population of mixed SCI and spinal cord lesions for demonstration of retrospective criterion validity.⁴ It was utilized in a multicenter randomized trial, assessed by blinded observers, and showed high correlations with lower extremity motor score (LEMS), balance, walking speed, six minute walk, and locomotor PIM illustrating prospective criterion validity.⁵ Lastly, it was utilized in an international study and shown to correlate with lower extremity motor scores (impairment) and followed a monotonic progression for demonstration of prospective construct validity.⁶ The hierarchical ranking, however, has not been assessed by a consumer population. Because professionals (SCI investigators, physicians and physical therapists) were instructed to rank the hierarchy along an impairment dimension, worst to best, the scale integrated physical assistance with devices (see Table 1). Our hypothesis is that consumers would rank the WISCI hierarchy based on a functional independence dimension as compared to impairment and therefore WISCI levels that require physical assistance would be placed as a lower level than those that do not use physical assistance.

Subjects and Methods

Demographics

This study was approved by the institutional review boards (IRB) at Thomas Jefferson University and Magee Rehabilitation Hospital. Volunteer subjects were recruited from the SCI Lifetime Follow-Up Clinic at Magee Rehabilitation Hospital. Sixteen individuals with chronic, motor incomplete spinal cord injury agreed to participate. Participant sample included: Level of injury – 11 cervical, 2 thoracic, 3 lumbar; ASIA Impairment Scale – D=9, C=5, B=2; Age Range -19 to 66, mean 43.8; 13 male and 3 female; average time post injury = 8 years, range 5 to 13 years.

Method

Photographs were taken by study personnel depicting each defined WISCI level (21 photos in all) using the same model and a similar background in order to ensure uniformity of the pictures other than the defined differences in the WISCI levels. The pictures were printed out on a color laser printer on a half sheet of paper with the written WISCI descriptors at the bottom of each photo (See Figure 1). The photographs were randomly shuffled.

Each participant was scheduled to meet one-on-one with the research coordinator. Subjects sat at a large table, were presented with a stack of pictures randomly shuffled and asked to do the following: "Put these pictures in rank order by your preference for walking from worst to best." Each session lasted approximately 30 minutes and participants were reimbursed for their time. The responses of each participant were entered into an excel spreadsheet for analysis. Major shifts in levels were calculated in percentages. Descriptive statistics (mean and median) were compared with professionals.

Figure 1: Examples of Uniformity of WISCI Pictures



Two crutches, brace, no assistance

No device, no brace, one person assist

Results

- Consumer ranking of the WISCI levels based on preference for walking differed from the hierarchical ranking of the WISCI scale, particularly WISCI levels requiring physical assistance outside of the parallel bars. (See Table 2)
- In general, WISCI levels requiring physical assistance were ranked lower by 50% of consumers (8/16); in particular levels 17, 14, 10, and 8 shifted lower (See Table 3). Levels 14 and 17 show that 75% of consumers ranked these two levels with physical assistance much lower than professionals (See Figures 2A and 2B).
- 50% of consumers ranked level 9 (walker, brace, no assistance) much higher than 8 (walker, no brace, 1 person assist) by 4 to 6 levels. These shifts are seen on raw data inspection.
- 25% of consumers ranked level 13 (walker, no braces, no assistance) higher than level 16 (two crutches, no braces, no assistance) and verbally reported a walker has more stability than 2 crutches.

Discussion

These pilot results suggest that different criterion dimensions (implicit or explicit) yield differing values given to walking preferences between consumers and professionals. Therefore, what is important as an ambulation goal differs depending on what is asked and who is asked. For research to demonstrate neurological improvement the question is "Is there a change in walking capacity level?" For consumer walking preference the question is "Is there a change in independence level?" Measures of minimal clinical significance of recovery need to be tailored to the specific research question and to the specific group assessed.

Figure 2A: Frequency of Consumer Ranking WISCI Level 14 (one cane, no brace, one person assist)

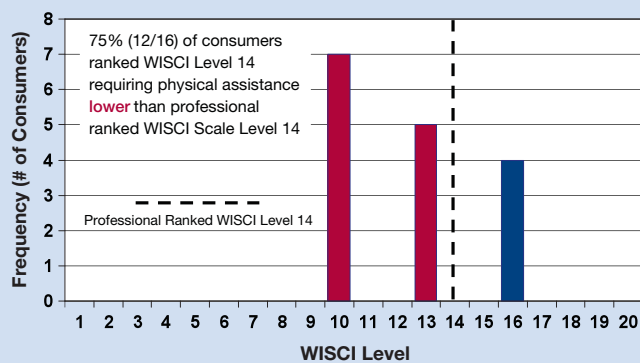


Figure 2B: Frequency of Consumer Ranking WISCI Level 17 (no devices, no braces, one person assist)

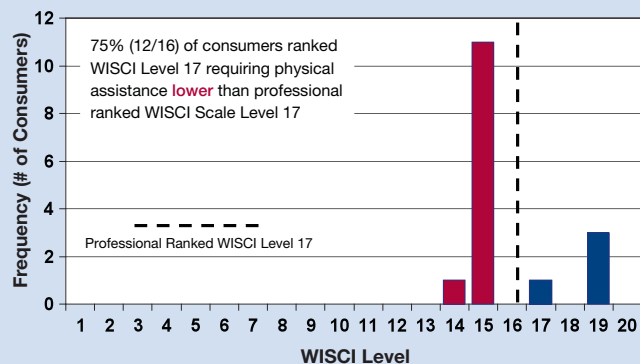


Table 1: WISCI Scale

Scoring Sheet for Walking Index for Spinal Cord Injury (WISCI II)				
Name _____	Date _____			
<i>Check descriptors that apply to current walking performance, and then assign the highest level of walking performance. (In scoring a level, one should choose the level at which the patient is safe as judged by the therapist, with patient's comfort level described. If devices other than those stated in the standard definitions are used, they should be documented as descriptors. If there is a discrepancy between two observers, the higher level should be chosen.)</i>				
Gait: reciprocal _____; swing through _____				
Descriptors				
Devices	Braces	Assistance	Patient Reported Comfort Level	
/bars < 10 meters	Long Leg Braces- Uses 2 Uses 1	Max Assist x 2 people	Very Comfortable	
/bars 10 meters	Short Leg Braces- Uses 2 Uses 1	Min/Mod assist x 2 people	Slightly comfortable	
Walker- Standard Rolling Platform	Locked at knee _____ Unlocked at knee _____	Min/mod assist x 1 person	Neither comfortable nor uncomfortable	
Crutches- Uses 2 Uses 1	Other _____		Slightly uncomfortable	
Canes- Quad Uses 2 Uses 1			Very uncomfortable	
No devices	No braces	No assistance		
WISCI Levels				
Level	Devices	Braces	Assistance	Distance
0				Unable
1	Parallel bars	Braces	2 persons	Less than 10 meters
2	Parallel bars	Braces	2 persons	10 meters
3	Parallel bars	Braces	1 person	10 meters
4	Parallel bars	No braces	1 person	10 meters
5	Parallel bars	Braces	No assistance	10 meters
6	Walker	Braces	1 person	10 meters
7	Two crutches	Braces	1 person	10 meters
8	Walker	No braces	1 person	10 meters
9	Walker	Braces	No assistance	10 meters
10	One cane/crutch	Braces	1 person	10 meters
11	Two crutches	No braces	1 person	10 meters
12	Two crutches	Braces	No assistance	10 meters
13	Walker	No braces	No assistance	10 meters
14	One cane/crutch	No braces	1 person	10 meters
15	One cane/crutch	Braces	No assistance	10 meters
16	Two crutches	No braces	No assistance	10 meters
17	No devices	No braces	1 person	10 meters
18	No devices	Braces	No assistance	10 meters
19	One cane/crutch	No braces	No assistance	10 meters
20	No devices	No braces	No assistance	10 meters
Level assigned _____				

Table 2: Consumer Agreement with WISCI II Scale

WISCI Level	Agreement Frequency	% agreement	Descriptors
20 = ND, NB, NA	16/16	100.00%	
19 = 1C, NB, NA	3/16	18.75%	
18 = ND, B, NA	2/16	12.50%	
17 = ND, NB, 1P	1/16	6.25%	Assist
16 = 2C, NB, NA	4/16	25.00%	
15 = 1C, B, NA	2/16	12.50%	
14 = 1C, NB, 1P	0/16	0.00%	Assist
13 = W, NB, NA	1/16	6.25%	
12 = 2C, B, NA	3/16	18.75%	
11 = 2C, NB, 1P	2/16	12.50%	Assist
10 = 1C, B, 1P	6/16	37.50%	Assist
9 = W, B, NA	0/16	0.00%	
8 = W, NB, 1P	2/16	12.50%	Assist
7 = 2C, B, 1P	1/16	6.25%	Assist
6 = W, B, 1P	9/16	56.25%	Assist
5 = PB, B, NA	11/16	68.75%	
4 = PB, NB, 1P	12/16	75.00%	
3 = PB, B, 1P	14/16	87.50%	
2 = PB, B, 2P	14/16	87.50%	
0 = WC	15/16	93.75%	

Table 3: Ranking of the WISCI Scale: Professional² versus Consumer based on mean and median scores

WISCI Level	Professional Mean	Consumer Mean	Professional Median	Consumer Median
0 = WC		0.13		0
2 = PB, B, 2P	2	2.38	2	2
3 = PB, B, 1P	3	3.56	3	3
4 = PB, NB, 1P	5.88	4.31	4.5	4
5 = PB, B, NA	6	5.38	5	5
6 = W, B, 1P	5.5	6.25	5	6
7 = 2C, B, 1P	7.75	8.56	7	8
8 = W, NB, 1P	9.25	8.44	9	8
9 = W, B, NA	9.63	10.56	9.5	11
10 = 1C, B, 1P	11.13	9.56	10.5	10
11 = 2C, NB, 1P	11.63	12.38	11.5	13.5
12 = 2C, B, NA	11.75	13.19	12.5	12.5
13 = W, NB, NA	13.88	11.63	14.5	12
14 = 1C, NB, 1P	14.13	12.44	15	13
15 = 1C, B, NA	15.25	12.38	16.5	12
16 = 2C, NB, NA	15.88	15.38	16	15.5
17 = ND, NB, 1P	17.5	15.81	18	15
18 = ND, B, NA		18.25		19
19 = 1C, NB, NA	18.63	18.19	19	18
20 = ND, NB, NA	20	20.00	20	20

Word Key

ND = No Device
1C = One Cane/Crutch
2C = Two Cane/Crutch
W = Walker
PB = Parallel Bars
WC = Wheelchair
B = Braces
NB = No Braces
NA = No Assistance
1P = One Person Assist
2P = 2 Person Assist

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