

ORGANIZATION NEWS

Highlights From the Rehabilitation Measures Database

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Measurement Characteristics and Clinical Utility of the Modified Fatigue Impact Scale in Individuals With Multiple Sclerosis

Ana Miskovic, BA, Linda Ehrlich-Jones, PhD, RN

Multiple sclerosis (MS) is an autoimmune disease affecting approximately 2.3 million people worldwide.¹ Fatigue occurs in approximately 80% of individuals with MS.² The Modified Fatigue Impact Scale (MFIS) is a modified form of the Fatigue Impact Scale,³ based on items derived from interviews with patients with MS concerning how fatigue affects their lives. The full-length MFIS has 21 items, whereas the short version has 5 items. The full-length version generates 3 subscales (physical, cognitive, and psychosocial functioning), which assess the perceived effect of fatigue during the last 4 weeks.⁴ Participants rate the MFIS on a 5-point Likert scale from 0 (never) to 4 (almost always). Total scores range from 0 to 84; for the subscale scores, the physical subscale ranges from 0 to 36, the cognitive subscale ranges from 0 to 40, and the psychosocial functioning subscale ranges from 0 to 8. The scores range from 0 to 20 for the 5-item version. Higher numbers indicate greater fatigue. The scale has been shown to have adequate to excellent concurrent and content validity^{4,7} and excellent test-retest reliability in patients with MS.^{4,5} Rasch analysis revealed that the 21-item scale was found to contain a physical and cognitive dimension (the original 2 social items were found to be part of the physical dimension).⁶ Additionally, the MFIS has been found to show change after a 4-week intervention.⁸ The MFIS can be administered and scored in 5 to 10 minutes, making it a clinically useful and low-burden instrument. The MFIS is free to use, and has been recommended by the Neurology Section of the American Physical Therapy Association's Multiple Sclerosis Taskforce.

This abbreviated summary provides a review of the psychometric properties of the MFIS in people with MS. A full review of the MFIS and reviews of nearly 377 other instruments for patients with various health conditions can be found at www.rehabmeasures.org.

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BIBLIOGRAPHY

1. Browne P, Chandraratna D, Angood C, et al. Atlas of multiple sclerosis 2013: a growing global problem with widespread inequity. *Neurology* 2014;83:1022-4.
2. Larson RD. Psychometric properties of the modified fatigue impact scale. *Int J MS Care* 2013;15:15-20.
3. Fisk JD, Ritvo PG, Ross L, Haase DA, Marrie TJ, Schlech WF. Measuring the functional impact of fatigue: initial validation of the fatigue impact scale. *Clin Infect Dis* 1994;18 Suppl 1:S79-83.
4. Rietberg MB, Van Wegen EE, Kwakkel G. Measuring fatigue in patients with multiple sclerosis: reproducibility, responsiveness and concurrent validity of three Dutch self-report questionnaires. *Disabil Rehabil* 2010;32:1870-6.
5. Amtmann D, Bamer AM, Noonan V, Lang N, Kim J, Cook KF. Comparison of the psychometric properties of two fatigue scales in multiple sclerosis. *Rehabil Psychol* 2012;57:159-66.
6. Mills RJ, Young CA, Pallant JF, Tennant A. Rasch analysis of the Modified Fatigue Impact Scale (MFIS) in multiple sclerosis. *J Neurol Neurosurg Psychiatry* 2010;81:1049-51.
7. Tellez N, Rio J, Tintore M, Nos C, Galan I, Montalban X. Does the Modified Fatigue Impact Scale offer a more comprehensive assessment of fatigue in MS? *Mult Scler* 2005;11:198-202.
8. Kos D, Kerckhofs E, Carrea I, Verza R, Ramos M, Jansa J. Evaluation of the Modified Fatigue Impact Scale in four different European countries. *Mult Scler* 2005;11:76-80.

This instrument summary is designed to facilitate the selection of outcome measures by clinicians. The information contained in this summary represents a sample of the peer-reviewed research available at the time of this summary's publication. The information contained in this summary does not constitute an endorsement of this instrument for clinical practice. The views expressed are those of the summary authors and do not represent those of authors' employers, instrument owner(s), the *Archives of Physical Medicine and Rehabilitation*, the Rehabilitation Measures Database, or the U.S. Department of Health and Human Services. The information contained in this summary has not been reviewed externally.

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		Measure Name:	Acronym:	Summary Authors:												
		Modified Fatigue Impact Scale	MFIS	A. Miskovic, & L. Ehrlich-Jones												
Populations Reviewed:	Admin Time:	Items:		Score (min/max):												
Multiple Sclerosis (MS)	Full-length version: 5-10 min	Full-length version: 21 Abbreviated version: 5		Total score (0/84) Subscales: Physical (0/36) Cognitive (0/40) Psychosocial Functioning (0/8) Abbreviated version (0/20)												
Purpose and Administration Instructions:																
The MFIS provides an assessment of the effects of fatigue in terms of physical, cognitive, and psychosocial functioning. Participants rate on a 5-point Likert scale, with 0 = 'Never' to 4 = 'Almost always' their agreement with 21 statements. Higher numbers indicate greater fatigue.																
Required Equipment:	Training Required:															
Questionnaire and pen	Training can be done by downloading and reading the MSQLI document on the MS site: http://www.nationalmssociety.org															
Validity:			Internal Consistency: ⁸													
<p><u>Construct validity:</u> Given the Rasch analysis, Mills et al.⁶ suggested that the physical and cognitive subscales should be used separately eliminating questions 4, 14, 17 from the physical and questions 1-3, 5, and 11. The authors suggest the total score not be used.</p> <p><u>Concurrent validity:</u> Excellent: MFIS vs. Fatigue Severity Scale (FSS): $r = 0.66$; MFIS vs. the Checklist Individual Strength (CIS20R): $r = 0.54$⁴ Excellent: between MFIS and FSS ($r=0.68$, $p<0.0001$)⁷ Adequate to Excellent: between MFIS subscale and FSS⁷ MFIS-physical: $r=0.75$, $p<0.0001$⁷ MFIS-cognitive: $r=0.44$, $p<0.0001$⁷ MFIS-psychosocial: $r= 0.62$, $p<0.0001$⁷</p> <p><u>Content Validity:</u>⁵ Spearman Rank Correlation Fatigue Severity Scale to MFIS: Excellent for MFIS total and subscales of physical and psychosocial (0.69-0.77) Adequate for MFIS cognitive subscale IRT analyses indicate that the FSS is less precise in measuring both low and high levels of fatigue, compared with the MFIS. For those interested in measuring both physical and cognitive aspects of fatigue, and whose sample is expected to have higher levels of fatigue, the MFIS is a better choice even though it is longer.</p>			<ul style="list-style-type: none"> MFIS has been found to show change after intervention. After a 4-week rehabilitation program, the MFIS did change, but the FSS did not. 													
			Reliability:													
			Excellent test-retest reliability (ICC =0.85) ⁴ Excellent reliability: Cronbach's alpha = 0.94-0.96 for total MFIS ⁵													
			Normative Data:													
			MS: Median MFIS score= 33.0 (range 0-82) ⁷													
			Scoring Information:													
			Scoring for standard version: either represented as a total score by summing the totals from each subscale or by each individual subscale. Physical subscale: range from 0-36 Add raw scores on items: 4+6+7+10+13+14+17+20+21 Cognitive subscale: range from 0-40 Add raw scores on items: 1+2+3+5+11+12+15+16+18+19 Psychosocial subscale: range from 0-8 Add raw scores on items: 8+9 Scoring for 5-item version: Total score is the sum of items 1+9+10+17+19 Range from 0-20													
Minimally Clinically Important Difference (MCID): ⁴																
Smallest Detectable Change (SDC) = 16.2 Minimal Detectable Change (MDC) % = 19.3%																
Floor Effects: ⁵		Ceiling Effects: ⁵														
MFIS total = 1.1%		MFIS total = 0.7%														
MFIS-physical = 1.6%		MFIS-physical = 1.6%														
MFIS-cog = 2.7%		MFIS-cog = 0.9%														
MFIS-psychosocial = 7.4%		MFIS-psychosocial = 9.0%														
Considerations:			Cut-off Criteria:													
The MFIS is a shortened modification of the Fatigue Impact Scale ³ , designed as a self-report measure to rate fatigue in Multiple Sclerosis. The MFIS cannot be used to generate a single overall score of fatigue. The conceptual interaction between the two dimensions remains unclear, which poses problems when interpreting change scores in these individual scales. Studies in which a global MFIS score was used as either an outcome measure or selection tool may need to be re-evaluated. ⁶			<table border="1"> <thead> <tr> <th></th> <th><i>r</i></th> <th>ICC</th> </tr> </thead> <tbody> <tr> <td>Excellent</td> <td>≥ .6</td> <td>≥ .75</td> </tr> <tr> <td>Adequate</td> <td>.31-.59</td> <td>.40 -.74</td> </tr> <tr> <td>Poor</td> <td>≤ .3</td> <td>< .4</td> </tr> </tbody> </table>			<i>r</i>	ICC	Excellent	≥ .6	≥ .75	Adequate	.31-.59	.40 -.74	Poor	≤ .3	< .4
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