

**NINDS CDE Notice of Copyright
Fatigue Severity Scale (FSS) of Sleep Disorders**

Availability:	<p>Freely Available for non-profit research: Please click here for the Fatigue Severity Scale of Sleep Disorders For pharmaceutical studies: Copyright belongs to Dr. Lauren Krupp. Permission required for use. Lauren.Krupp@stonybrook.edu</p>
Classification:	<p>Supplemental: Parkinson’s Disease (PD), Multiple Sclerosis (MS) and Spinal Cord Injury (SCI) Exploratory: Amyotrophic Lateral Sclerosis (ALS)</p>
Short Description of Instrument:	<p>Construct measured: Impact of fatigue on patient’s daily life Generic vs. disease specific: Generic Means of administration: Interview or paper and pencil Intended respondent: Patient # of items: 9 # of subscales and names of sub-scales: N/A # of items per sub-scale: N/A</p>
Comments/Special instructions:	<p>Scoring: Each item is a statement on fatigue that the subject rates from 1 (strongly disagree) to 7 (strongly agree). The scoring is done by calculating the average response to the questions (adding up all the answers and dividing by nine). Absolute thresholds for clinical meaningfulness have not been formally defined, although scores greater than 4 to 5 are considered indicative of significant fatigue. Background: The FSS was developed and initial validation completed in patients with multiple sclerosis and systemic lupus, but the scale has been used in studies of fatigue in multiple other diseases including SCI. The FSS was recently suggested for both a screening and a rating instrument by a MDS Task Force. There are several more expansive scales that may be appropriate in a given study.</p>
Rationale/Justification	<p>Strengths/Weaknesses: Administration only takes a few minutes. Limited data on psychometric properties of the FSS in North American MS populations are available. Psychometric Properties: NOTE: Summary of demonstrated properties below includes data from both N. American and European MS studies. Reliability: Cronbach’s alpha .81 to .89; Cronbach's alpha in a Swiss MS cohort = .94. Convergent Validity: correlates with MFIS Spearman $r=.68$, $p<.0001$ in a majority RRMS Spanish population; $r=.66$, $p<.0001$ in a four-country European study; Kendall's Tau-b = 0.645, Dutch FSS; high correlation with fatigue VAS in a Swiss MS cohort ($r=.79$). Divergent Validity: Modest correlation with Beck Depression Inventory ($r = .48$) and EDSS ($r= .45$, $p<.0001$; $r= 0.33$, $p<.0001$ after adjusting for BDI) in an RRMS predominate Spanish population; correlation with EDSS ($r = .34$, $p<.01$) in a Swiss MS cohort. Sensitivity: Dutch FSS not responsive to change ($z = -1.417$, $p= .156$) following a four-week rehabilitation program. Administration: The FSS only takes a few minutes to administer.</p>

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References:	<p>Key Reference:</p> <p>Krupp L et al. The Fatigue Severity Scale: Application to Patients With Multiple Sclerosis and Systemic Lupus Erythematosus. <i>Arch Neurol</i> 1989;46(10):pp.1121-1123.</p> <p>Other References:</p> <p>Bello-Haas VD, Florence JM, Kloos AD, Scheirbecker J, Lopate G, Hayes SM, Piro EP, Mitsumoto H. A randomized controlled trial of resistance exercise in individuals with ALS. <i>Neurology</i>. 2007 Jun 5;68(23):2003-2007.</p> <p>Carter GT, Weiss MD, Lou JS, Jensen MP, Abresch RT, Martin TK, Hecht TW, Han JJ, Weydt P, Kraft GH. Modafinil to treat fatigue in amyotrophic lateral sclerosis: an open label pilot study. <i>Am J Hosp Palliat Care</i>. 2005 Jan-Feb;22(1):55-9.</p> <p>Drory VE, Goltsman E, Reznik JG, Mosek A, Korczyn AD. The value of muscle exercise in patients with amyotrophic lateral sclerosis. <i>J Neurol Sci</i>. 2001 Oct 15;191(1-2):133-7.</p> <p>Evatt ML, Chaudhuri KR, Chou KL, Cubo E, Hinson V, Kompoliti K, Yang C, Poewe W, Rascol O, Sampaio C, Stebbins GT, Goetz CG. Dysautonomia rating scales in Parkinson's disease: sialorrhea, dysphagia, and constipation--critique and recommendations by movement disorders task force on rating scales for Parkinson's disease. <i>Mov Disorders</i> 2009 Apr 15; 24(5):635-646.</p> <p>Friedman JH, Alves G, Hagell P, (Hagell, Peter); Marinus J, Marsh L, Martinez-Martin P, Goetz CG, Poewe W, Rascol O, Sampaio C, Stebbins G, Schrag A, Fatigue Rating Scales Critique and Recommendations by the Movement Disorders Society Task Force on Rating Scales for Parkinson's Disease <i>Movement Disorders</i> 2010, May; 25 (7): 805-822.</p> <p>Kos D, Kerckhofs E, Carrea I, Verza R, Ramos M, Jansa J Evaluation of the Modified Fatigue Impact Scale in four different European countries. <i>Mult Scler</i> 2005;11(1):76-80.</p> <p>Kos D, Kerckhofs E, Nagels G, D'Hooghe BD, Duquet W, Duportail M, Ketelaer P. Assessing fatigue in multiple sclerosis : Dutch Modified Fatigue Impact Scale. <i>Acta Neurol Belg</i> 2003;103:185-191.</p> <p>Krupp L, LaRocca NG, Muir-Nash J, Steinberg AD. The fatigue severity scale. <i>Arch Neurol</i> 1989;46: 1121-3.</p> <p>Lo Coco D, La Bella V. Fatigue, sleep, and nocturnal complaints in patients with amyotrophic lateral sclerosis. <i>Eur J Neurol</i>. 2012 Jan 10. doi: 10.1111/j.1468-1331.2011.03637.x. [Epub ahead of print]</p> <p>Perez Lloret S, Piran Arce G, Rossi M, Caivano Nemet ML, Salsamendi P, Merello M. Validation of a new scale for the evaluation of sialorrhea in patients with Parkinson's disease. <i>Movement Disorders</i> 2007 Jan; 22(1):pp.107-111.</p> <p>Sanjak M, Bravver E, Bockenek WL, Norton HJ, Brooks BR. Supported treadmill ambulation for amyotrophic lateral sclerosis: a pilot study. <i>Arch Phys Med Rehabil</i>. 2010 Dec;91(12):1920-1929.</p> <p>Tellez N, Río J, Tintoré M, Nos C, Galán I, Montalban X. Does the Modified Fatigue Impact Scale offer a more comprehensive assessment of fatigue in MS? <i>Mult Scler</i> 2005;11(2):198-202.</p> <p>Valko PO, Bassetti CL, Bloch KE, Held U, Baumann CR. Validation of the Fatigue Severity Scale in a Swiss Cohort. <i>Sleep</i> 2008;31(11):1601-1607.</p>
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References (cont):	<p>SCI-specific:</p> <p>Anton HA, Miller WC, Townson AF. Measuring fatigue in persons with spinal cord injury. <i>Arch Phys Med Rehabil.</i> 2008 Mar;89(3):538-542.</p> <p>Imam B, Anton HA, Miller WC. Measurement properties of a telephone version of the Modified Fatigue Impact Scale among individuals with a traumatic spinal cord injury. <i>Spinal Cord.</i> 2012 Dec;50(12):920-924.</p> <p>Menon N, Gupta A, Khanna M, Taly AB, Thennarasu K. Prevalence of depression fatigue and sleep disturbances in patients with myelopathy: Their relation with functional and neurological recovery. <i>J Spinal Cord Med.</i> 2015 Jan 13. [Epub ahead of print] PubMed PMID: 25582227.</p> <p>Nooijen CF, Vogels S, Bongers-Janssen HM, Bergen MP, Stam HJ, van den Berg-Emons HJ; Act-Active Research Group. Fatigue in persons with subacute spinal cord injury who are dependent on a manual wheelchair. Spinal Cord. 2015 Oct;53(10):758-7 PubMed PMID: 25896345.</p>
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