

List of measures for cancer-related fatigue that have been validated in survivors of childhood, adolescent, and young adult cancers

Full name	Versions	No. of items	No. of (sub)scales	Cut-off	Availability	Available languages	Description
Patient-Reported Outcomes Measurement Information System (PROMIS) Pediatric Fatigue measure[57] ^a	Parent Proxy Bank v2.0 Fatigue (5-17 yrs)	23	Unidimensional	..	Yes: http://www.healthmeasures.net/index.php?Itemid=992	Parent Proxy Bank v2.0 Fatigue: English Parent Proxy Short Form v.2.0 Fatigue 10a: English, German, Hebrew, Italian, Japanese, Korean, Spanish Pediatric Bank v2.0 Fatigue: Dutch, English, Spanish Pediatric Short Form v2.0 Fatigue 10a: Dutch, English, German, Hebrew, Italian, Japanese, Korean, Simplified Chinese (Mandarin), Spanish	PROMIS® (Patient-Reported Outcomes Measurement Information System) is a set of person-centered measures that evaluates and monitors physical, mental, and social health in adults and children. PROMIS Pediatric Fatigue measure assesses fatigue over the past seven days. Pediatric self-report should be considered the standard, proxy-report should be used if self-report is not possible (child too young, too ill, cognitively impaired). Higher scores indicate more fatigue.
	Parent Proxy Short form v2.0 Fatigue 10a (5-17 yrs)	10					
	Pediatric Bank v2.0 Fatigue (8-17 yrs)	25					
	Pediatric Short Form v2.0 Fatigue 10a (8-17 yrs)	10					
	Several versions of PROMIS Fatigue measure for adult cancer survivors	4-54					
PedsQL Multi-dimensional Fatigue Scale[28] (PedsQL MFS) ^{a,b}	Toddlers (2-4 years) ^a	18	Three: 1. General fatigue 2. Sleep/rest fatigue 3. Cognitive fatigue	No cut-off; One study[25] used the cut-off ≤ 1 SD below mean of healthy controls	Yes (for non-funded academic users, registration is required): https://eprovide.mapi-trust.org/instruments/pediatric-quality-of-life-inventory-multidimensional-fatigue-scale	Self-report (except Toddlers), standard version: Arabic ^{a,b,c,d,e} , Bosnian ^{c,d,e} , Bulgarian ^{c,d,e} , Croatian ^{c,d,e} , Czech ^{b,c,d,e} , Danish ^{a,b,c,d,e,f} , Dutch ^{a,b,c,d,e,f} , English ^{a,b,c,d,e,f} , Estonian ^{c,d,e} , Finnish ^{a,b,c,d} , French ^{a,b,c,d,e,f} , German ^{a,b,c,d,e,f} , Greek ^{c,d} , Hebrew ^{b,c,d,e} , Hungarian ^{b,c,d,e} , Italian ^{a,b,c,d,e,f} , Japanese ^{a,b,c,d} , Korean ^{c,d} , Lithuanian ^{a,b,c,d} , Malay ^{c,d} , Mandarin Chinese ^{a,b,c,d,e} , Norwegian ^{b,c,d,e} , Polish ^{a,b,c,d,e} , Portuguese ^{a,b,c,d,e,f} , Romanian ^{a,b,c,d,e} , Russian ^{a,b,c,d,e} , Serbian (Cyrillic) ^{c,d,e} , Serbian (Latin) ^{c,d,e} , Slovenian ^{c,d,e} , Spanish ^{a,b,c,d,e,f} , Swedish ^{b,c,d} , Tamil ^{c,d} , Thai ^{c,d} , Turkish ^{a,b,c,d,e,f} , Ukrainian ^{c,d,e}	The PedsQL MFS is a specific module of the PedsQL™. The PedsQL MFS was designed as a generic symptom-specific instrument to measure fatigue in patients with acute and chronic health conditions as well as healthy school and community populations. For each age-segment there are both an acute (past 7 days) and a standard version (past month), and both parent-proxy reported and self-reported scales (except from toddlers, where only a parent-proxy reported scale is available). There are 6 items for each subscale, and higher total scale scores indicate less fatigue.
	Young child (5-7 years) ^p						
	Child (8-12 years) ^c						
	Adolescent (13-18 years) ^d						
	Young Adult (18-25 years) ^e						
	Adult (>26 years) ^f						
Fatigue Scale[58-60] (FS) ^{a,b}	Child (FS-C; 7-12 years)[58]	14	Unidimensional	Yes: FS-C reduced version: ≥ 12 [59] No cut-offs for the other versions	Yes, by contacting authors: P. Hinds PSHinds@childrensnational.org A copy of the FS-A is included in the authors' original article[60]	English (all versions) Chinese (FS-C, FS-A) Spanish (FS-A)	The FS-C and the FS-A measure self-reported fatigue during the previous week among children (7-12 years old) and adolescents (13-18 years old) with cancer. The FS-P assesses parents' perception of their child's fatigue in the last week. The FS-S assesses health professionals' perceptions of the child's fatigue during the last week. All the measures use 5-point Likert scales, and higher total scale scores indicate greater amount of perceived fatigue.
	Child reduced version (10-item FS-C; 7-12 years)[59]	10					
	Adolescent (FS-A; 13-18 years)[60]	14					
	Parent (PFS[58]; FS-P[59, 60])[58-60]	18[58] 14[59]					
	Staff (SFS[58]; FS-S[60])[58, 60]	9[58]					

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Multidimensional Fatigue Inventory[61, 62] (MFI-20) ^a	..	20	Five: 1. General fatigue 2. Physical fatigue 3. Mental fatigue 4. Reduced motivation 5. Reduced activity	75% percentile (moderate fatigue) 90% percentile (severe fatigue) of an age- and sex-matched representative sample of the general population[63]	Yes, by contacting authors: E.M.A. Smets e.m.smets@amc.uva.nl A copy of the English MFI-20 can be found online:[64] https://www.med.upenn.edu/cbti/assets/user-content/documents/Multidimensional%20Fatigue%20Inventory%20(MFI).pdf	English French Chinese Hindi	The MFI-20 is a multidimensional short instrument that measures fatigue through five dimensions without containing any somatic item. The five domains of MFI-20 are measured by 20 questions that are scored on a scale from 1 to 7. Higher scores correspond to higher levels of fatigue.
Fatigue Thermometer (FT)[23] ^a	..	1	Unidimensional	Yes: ≥ 4 [65, 66]	The Fatigue Thermometer combines a visual analogue scale with a numeric rating scale: an image of a vertical thermometer with the ends labeled as "no fatigue" (0) and "worst fatigue imaginable" (10), and the thermometer labeled from 0-10. Scores were categorized as no fatigue, mild fatigue (1-3), moderate fatigue (4-6), and severe fatigue (7-10).[66]
Turkish Scale for the Assessment of Fatigue in Pediatric Oncology Patients[56, 67] ^a	Child: 7-12 years[56] Adolescent: 13-18 years[67]	27 32	Three: 1. General problems 2. Sleep problems 3. Problems regarding treatment Four: 4. General problems 5. Sleep problems 6. Cognitive problems 7. Problems regarding treatment	Yes, 75 for child version and 75.5 for adolescent version	..	Turkish	These multidimensional scales measure fatigue by items that are scored on a scale from 1 to 5. Total score range is 27-135 for the child version, and 32-160 for the adolescent version. Higher scores correspond to lower levels of fatigue.
12-item fatigue questionnaire[48] ^a	..	12	Japanese	This measure assesses fatigue over the last month using a scale from 0 ("not at all") to 3 ("almost every day") for each item. Total fatigue score with a range of 0-36 is computed. Lower scores correspond to lower levels of fatigue.

Full name	Versions	No. of items	No. of (sub)scales	Cut-off	Availability	Available languages	Description
Pediatric Functional Assessment of Chronic Illness Therapy-Fatigue ^b (Peds-FACIT-F)[68]	Tested in pediatric patients aged 8-18 years	13	Unidimensional	..	Yes: A copy of the English questionnaire is available for free; others on request: https://www.facit.org/FACITOrg/Questionnaires	Arabic, Bulgarian, Chinese (simplified), Chinese (traditional), Croatia, Czech, Danish, Dutch, English, Finnish, French, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Latvian, Norwegian, Polish, Portuguese, Romanian, Russian, Serbian, Slovak, Slovene, Spanish, Swedish, Turkish	This measure assesses fatigue over the last seven days using a scale from 0 "none of the time" to 4 "all of the time". Total score with a range of 0-52 is computed by reverse coding 11/13 items. Lower scores correspond to higher levels of fatigue. The Peds-FACIT-F is a part of the Functional Assessment of Chronic Illness Therapy (FACIT) measurement system. It has been linked to the PROMIS Pediatric Fatigue measure (Cella et al. PROsetta Stone Analysis Report. PROMIS Pediatric Fatigue and Pediatric FACIT Fatigue. Online: http://www.prosetastone.org/LinkingTables1/Linking%20Tables%20Vol3/PROMIS%20Pediatric%20Fatigue%20and%20Pediatric%20FACIT%20Fatigue%20Full%20Report.pdf [accessed September 19th 2019]).
Memorial Symptom Assessment Scale (MSAS)[69] ^b	MSAS 7-12 years[70] MSAS 10-18 years[71] MSAS[69]	8 30 32	For the adult version (MSAS): 1. Global Distress Index (MSAS-GDI) 2. Physical Symptom Subscale (MSAS-PHYS) 3. Psychological Symptom Subscale (MSAS-PSYCH) 4. Total MSAS score (TMSAS)	..	Yes: A copy of the English questionnaire can be found online: http://www.npcrc.org/files/news/memorial_symptom_assessment_scale.pdf MSAS 7-12[70] and MSAS 10-18[71]: The English version of these questionnaires are included in the original articles.	18 translations https://eprovide.mapi-trust.org/instruments/memorial-symptom-assessment-scale	This measure assesses a diverse group of symptoms during the past week. If a symptom is present, then frequency, severity, and distress related to the symptom is assessed.
Daily Fatigue Report Scale[72] ^b	..	3/5	Unidimensional	..	Yes: The English version of this questionnaire is included in the original article.	..	This measure assesses fatigue daily (in the evening) with three numerical rating scales (0-10; severity, bother, and interference), and five open questions. Higher scores of the numerical rating scales indicate more severe fatigue, or higher bother/interference.
McCorkle Symptom Distress Scale (SDS)[73] ^b	..	13	Unidimensional	..	Yes: A copy of the English questionnaire is available for free (for non-funded academic users, registration is required): https://eprovide.mapi-trust.org/instruments/symptom-distress-scale	French for Canada, Mandarin for Taiwan, Spanish for the USA, Swedish	This measure assesses 11 symptoms on a 5-point Likert scale. One item is about frequency of fatigue (1="seldom", 5="most of the time"). Higher scores indicate higher symptom burden.

^aMeasure validated in studies identified by and included in this clinical practice guideline

^bMeasure validated in studies identified by and included in the Systematic Review by Tomlinson et al. (2013)[74]

References

23. Brand SR, Chordas C, Liptak C, Manley P, Recklitis C. Screening for fatigue in adolescent and young adult pediatric brain tumor survivors: accuracy of a single-item screening measure. *Support Care Cancer*. 2016;24(8):3581-7. doi:10.1007/s00520-016-3150-1.
28. Varni JW, Burwinkle TM, Katz ER, Meeske K, Dickinson P. The PedsQL in pediatric cancer: reliability and validity of the Pediatric Quality of Life Inventory Generic Core Scales, Multidimensional Fatigue Scale, and Cancer Module. *Cancer*. 2002;94(7):2090-106. doi:10.1002/cncr.10428.
48. Nagai A, Zou N, Kubota M, Kojima C, Adachi S, Usami I et al. Fatigue in survivors of childhood acute lymphoblastic and myeloid leukemia in Japan. *Pediatrics international : official journal of the Japan Pediatric Society*. 2012;54(2):272-6. doi:10.1111/j.1442-200X.2011.03530.x.
56. Kudubes AA, Bektas M, Ugur O. Developing a scale for the assessment of fatigue in pediatric oncology patients aged 7-12 for children and parents. *Asian Pac J Cancer Prev*. 2014;15(23):10199-207.
57. Hinds PS, Nuss SL, Ruccione KS, Withycombe JS, Jacobs S, DeLuca H et al. PROMIS pediatric measures in pediatric oncology: valid and clinically feasible indicators of patient-reported outcomes. *Pediatr Blood Cancer*. 2013;60(3):402-8. doi:10.1002/pbc.24233.
58. Hockenberry MJ, Hinds PS, Barrera P, Bryant R, Adams-McNeill J, Hooke C et al. Three instruments to assess fatigue in children with cancer: the child, parent and staff perspectives. *J Pain Symptom Manage*. 2003;25(4):319-28.
59. Hinds PS, Yang J, Gattuso JS, Hockenberry M, Jones H, Zupanec S et al. Psychometric and clinical assessment of the 10-item reduced version of the Fatigue Scale-Child instrument. *J Pain Symptom Manage*. 2010;39(3):572-8. doi:10.1016/j.jpainsymman.2009.07.015.
60. Hinds PS, Hockenberry M, Tong X, Rai SN, Gattuso JS, McCarthy K et al. Validity and reliability of a new instrument to measure cancer-related fatigue in adolescents. *J Pain Symptom Manage*. 2007;34(6):607-18. doi:10.1016/j.jpainsymman.2007.01.009.
61. Smets EM, Garssen B, Bonke B, De Haes JC. The Multidimensional Fatigue Inventory (MFI) psychometric qualities of an instrument to assess fatigue. *J Psychosom Res*. 1995;39(3):315-25.
62. Baptista RL, Biasoli I, Scheliga A, Soares A, Brabo E, Morais JC et al. Psychometric properties of the multidimensional fatigue inventory in Brazilian Hodgkin's lymphoma survivors. *J Pain Symptom Manage*. 2012;44(6):908-15. doi:10.1016/j.jpainsymman.2011.12.275.
67. Bektas M, Kudubes AA. Developing scales for the assessment of fatigue in Turkish pediatric oncology patients aged 13-18 and their parents. *Asian Pac J Cancer Prev*. 2014;15(22):9891-8.
68. Lai JS, Cella D, Kupst MJ, Holm S, Kelly ME, Bode RK et al. Measuring fatigue for children with cancer: development and validation of the pediatric Functional Assessment of Chronic Illness Therapy-Fatigue (pedsFACIT-F). *J Pediatr Hematol Oncol*. 2007;29(7):471-9. doi:10.1097/MPH.0b013e318095057a.
69. Portenoy RK, Thaler HT, Kornblith AB, Lepore JM, Friedlander-Klar H, Kiyasu E et al. The Memorial Symptom Assessment Scale: an instrument for the evaluation of symptom prevalence, characteristics and distress. *Eur J Cancer*. 1994;30A(9):1326-36. doi:10.1016/0959-8049(94)90182-1.
72. Erickson JM, Beck SL, Christian B, Dudley WN, Hollen PJ, Albritton K et al. Patterns of fatigue in adolescents receiving chemotherapy. *Oncol Nurs Forum*. 2010;37(4):444-55. doi:10.1188/10.ONF.444-455.
73. McCorkle R. The measurement of symptom distress. *Semin Oncol Nurs*. 1987;3(4):248-56.
74. Tomlinson D, Hinds PS, Ethier MC, Ness KK, Zupanec S, Sung L. Psychometric properties of instruments used to measure fatigue in children and adolescents with cancer: a systematic review. *J Pain Symptom Manage*. 2013;45(1):83-91. doi:10.1016/j.jpainsymman.2012.02.010.