

Brief Methodological Report

Fatigue in Parkinson's Disease: Measurement Properties of a Generic and a Condition-Specific Rating Scale

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Abstract

Context. High-quality fatigue rating scales are needed to advance the understanding of fatigue and determine the efficacy of interventions. Several fatigue scales are used in Parkinson's disease, but few have been tested using modern psychometric methodology (Rasch analysis).

Objectives. To examine the measurement properties of the generic Functional Assessment of Chronic Illness Therapy-Fatigue (FACIT-F) scale and the condition-specific 16-item Parkinson Fatigue Scale (PFS-16) using Rasch analysis.

Methods. Postal survey data ($n = 150$; 47% women; mean age 70 years) were Rasch analyzed. The PFS-16 scores were tested according to both the original polytomous and the suggested alternative dichotomized scoring methods.

Results. The PFS-16 showed overall Rasch model fit, whereas the FACIT-F showed signs of misfit, which probably was the result of a sleepiness-related item and mixing of positively/negatively worded items. There was no differential item functioning by disease duration but by fatigue status (greater likelihood of needing to sleep or rest during the day among people classified as nonfatigued) in the PFS-16 and FACIT-F. However, this did not impact total score-based estimated person measures. Targeting and reliability (≥ 0.86) were good, but the dichotomized PFS-16 showed compromised measurement precision. Polytomous and dichotomized PFS-16 and FACIT-F scores identified six, three, and four statistically distinct sample strata, respectively.

Conclusion. We found general support for the measurement properties of both scales. However, polytomous PFS-16 scores exhibited advantages compared with dichotomous PFS-16 and FACIT-F scores. Dichotomization of item responses compromises measurement precision and the ability to separate people, and should be avoided. *J Pain Symptom Manage* 2013;46:737–746. © 2013 U.S. Cancer Pain Relief Committee. Published by Elsevier Inc. All rights reserved.

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Key Words

Fatigue, Parkinson's disease, Rasch model, rating scales, reliability, validity

Introduction

Fatigue is common and troublesome in Parkinson's disease (PD).¹ Its etiology remains speculative, and specific therapy is lacking.¹⁻³ To advance the understanding of fatigue and determine the efficacy of interventions, there is a need for high-quality fatigue rating scales. A recent systematic review recommended four scales for rating fatigue in PD: the Multidimensional Fatigue Inventory, the Fatigue Severity Scale (FSS), the Functional Assessment of Chronic Illness Therapy-Fatigue Scale (FACIT-F), and the PD-specific 16-item Parkinson Fatigue Scale (PFS-16).⁴ These scales were all developed according to classical test theory principles,^{5,6} whereas modern test theory (particularly the Rasch model) is preferable to classical test theory in rating scale development and evaluation.^{5,7,8}

The relative merits of rating scales should preferably be determined in empirical head-to-head comparisons. To that end, the FACIT-F has exhibited better measurement precision than the FSS in PD.⁹ Similarly, a comparison between the FSS and the PFS-16 found both to be adequate, but reliability was somewhat better for the PFS-16.¹⁰ The generic FSS and FACIT-F appear to be the only fatigue scales among those identified as recommended⁴ that have been Rasch analyzed in PD.⁹ It is, therefore, unknown to what extent the PFS-16 meets the more rigorous demands of the Rasch model, and evidence is limited regarding its potential advantages over a generic fatigue scale.⁴

Herein, we report a Rasch-based head-to-head comparison of the measurement properties of the FACIT-F and the PFS-16 in PD.

Methods

Participants and Procedure

An anonymous postal survey was sent to all members registered as having PD in a regional branch of the Swedish PD Association ($n = 237$). The study was conducted in accordance with the Declaration of Helsinki, and all participants provided written consent.

Instruments

The PFS-16 comprises 16 items (Appendix) with five polytomous response categories (strongly disagree, disagree, do not agree or disagree, agree, and strongly agree).¹¹ Responses were scored from zero (strongly disagree) to four (strongly agree), yielding a summed total score ranging from zero to 64 (64 = more fatigue). This is equivalent to the original one to five scoring method.^{4,12} An alternative scoring method also has been proposed,¹¹ where item responses are dichotomized (agree and strongly agree = 1; all other responses = 0), giving a total score of zero to 16 (16 = more fatigue). Both scoring methods require complete responses to produce total scores. Herein, we refer to the polytomous (0-4) scoring as PFS-16p and to the dichotomized scoring as PFS-16d.

The FACIT-F consists of 13 items (Appendix) with five response categories, scored zero to four (not at all, a little bit, somewhat, quite a bit, and very much).¹³ The total score ranges from zero to 52 (52 = less fatigue) and requires completion of more than 50% (≥ 7) of the items (www.facit.org).

In addition, the Energy section of the Nottingham Health Profile (total scores, 0-100; 100 = worse)¹⁴ was used to identify the presence of fatigue; people who affirmed one or more of its three dichotomous (yes/no) items were classified as fatigued.⁹ Respondents rated their perceived PD severity as mild, moderate, or severe.

Statistical Analyses

All analyses were conducted separately for the FACIT-F and the polytomous and dichotomized PFS-16 scoring versions. To ease interpretation relative to the PFS-16, total FACIT-F scores were reversed (52 = more fatigue).

Data Completeness and Rasch Model Fit. Data completeness was studied by calculating the percentage of missing item responses; up to 10% missing data have been suggested as acceptable.¹⁵

Scales were analyzed regarding fit to the (partial credit) Rasch model.^{5,16-18} The Rasch

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