

Item banking to improve, shorten and computerize self-reported fatigue: An illustration of steps to create a core item bank from the FACIT-Fatigue Scale[☆]

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Abstract

Fatigue is a common symptom among cancer patients and the general population. Due to its subjective nature, fatigue has been difficult to effectively and efficiently assess. Modern computerized adaptive testing (CAT) can enable precise assessment of fatigue using a small number of items from a fatigue item bank. CAT enables brief assessment by selecting questions from an item bank that provide the maximum amount of information given a person's previous responses. This article illustrates steps to prepare such an item bank, using 13 items from the Functional Assessment of Chronic Illness Therapy Fatigue Subscale (FACIT-F) as the basis. Samples included 1022 cancer patients and 1010 people from the general population. An Item Response Theory (IRT)-based rating scale model, a polytomous extension of the Rasch dichotomous model was utilized. Nine items demonstrating acceptable psychometric properties were selected and positioned on the fatigue continuum. The fatigue levels measured by these nine items along with their response categories covered 66.8% of the general population and 82.6% of the cancer patients. Although the operational CAT algorithms to handle polytomously scored items are still in progress, we illustrated how CAT may work by using nine core items to measure level of fatigue. Using this illustration, a fatigue measure comparable to its full-length 13-item scale administration was obtained using four items. The resulting item bank can serve as a core to which will be added a psychometrically sound and operational item bank covering the entire fatigue continuum.

Key words: Computerized adaptive testing (CAT), Fatigue, Item bank, Item response theory (IRT), Rasch analysis, Rating scale model

Introduction

Fatigue is the most common unrelieved symptom of cancer [1–5]. It is understood as a subjective sensation of reduced energy, weakness, or lack of activity [6]. It is defined as an overwhelming, sustained sense of exhaustion and decreased capacity for physical and mental work [7, p. 58]. Cella et al. [2] proposed diagnostic criteria for cancer-related fatigue (CRF). These include diminished energy,

mental capacity and psychological condition, or increased need to rest, disproportionate to any recent change in activity level every day or nearly every day during the same 2-week period in the past month. These criteria have been preliminarily validated [8]. CRF is both multi-factorial in etiology and multi-dimensional in clinical expression. The specific etiology of many cases of cancer-related fatigue is complex and poorly understood. Its reported prevalence ranges widely, from 18 to 96% [6, 8]. CRF can affect physical activity, emotional well-being, social well-being and cognitive functioning. Whether this clinically evident multi-dimensionality can or should be assessed with

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