Original Article

Psychometric Testing of Three Chinese Fatigue Instruments in Taiwan

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Abstract

The purpose of this study was to evaluate the psychometric properties (reliabilities and validities) and ease of use of three translated fatigue instruments: Chinese versions of the Cancer Fatigue Scale, the Fatigue Symptom Inventory (FSI), and the Schwartz Cancer Fatigue Scale-revised. Convenience sampling was used to recruit 243 cancer outpatients at a chemotherapy treatment center in Taiwan. The results indicated that the three scales had good internal consistency (Cronbach's alphas for three total scales > 0.80) and were brief (less than 6 minutes to complete), valid (confirmed by convergent, divergent, and discriminant validity), and feasible measures (completion rates > 97%) of fatigue for use with Taiwanese cancer patients. However, 27% of cancer patients reported that the FSI was difficult for them to complete. Differences in factorial validity between each original scale and its Chinese version indicate a need for further testing in Taiwan. J Pain Symptom Manage 2006;32:155–167.

Key Words

Neoplasm, fatigue, psychometric testing, reliability, construct validity

Introduction

Cancer-related fatigue (CRF) is the most prevalent symptom occurring in individuals with cancer who receive any type of cancer-related treatment at any stage of the disease.[1–3] Despite the acknowledgment of fatigue as a great concern to cancer patients, the specific mechanisms involved in the development of CRF are not completely known and there has been no general agreement regarding a definition of fatigue. Physiologists consider fatigue to be poor physical performance, whereas pathologists view fatigue as an indicator of neuromuscular or metabolic disorders.[4] Psychologists view fatigue as a mental process involving, for example, poor concentration, and oncologists view fatigue as a general feeling of debilitating tiredness or loss of energy.[5]

From the oncology perspective, the National Comprehensive Cancer Network has defined CRF as "a persistent, subjective sense of tiredness related to cancer or cancer treatment that interferes with usual functioning."[6] CRF is a complex, multidimensional, and multicausal phenomenon. Its multiple dimensions include temporal, physical/sensory, affective/emotional, mental/cognitive, and behavioral dimensions.[7] Although there is a controversy

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about whether CRF is caused by cancer itself or cancer-related treatments, most research results based on cross-sectional designs indicate that fatigue is significantly related to different types of treatment.[8–11] Women treated with a combination of chemotherapy and radiation therapy or with chemotherapy alone experienced more fatigue than those treated with only radiation therapy.[9,11] This means that treatment method is a crucial factor with respect to fatigue; greater fatigue is caused by a combination of chemotherapy and radiation therapy or chemotherapy alone.

Because fatigue is highly subjective and unique to the person experiencing it, self-report from patients is the most effective method to measure fatigue. Therefore, improvement in the management of cancer-related fatigue requires accurate and precise measurement. A growing number of self-report measurement tools are currently in use.[7,12,13] These include single-item, single-dimension scales (e.g., the Rhoten Fatigue Scale); multiple-item, single-dimension scales (e.g., the Brief Fatigue Inventory); and multiple-item, multidimensional scales (e.g., the Multidimensional Fatigue Symptom Inventory [MFSI-SF]). Because the single-item format has limited reliability and provides little information about patients' experience with fatigue, fatigue is often measured using multiple-item measures.[14] Furthermore, fatigue is widely viewed as a multidimensional phenomenon and the most appropriate criterion for choosing a measurement tool is its multidimensionality. As a result, several investigators have developed and validated multidimensional measures of fatigue.

Until now, nine multidimensional instruments that are related to fatigue but are not part of scales measuring functional ability or quality of life have been developed, including the Cancer Fatigue Scale (CFS), the Fatigue Assessment Questionnaire (FAQ), the Fatigue Symptom Inventory (FSI), the Lee Fatigue Scale (LFS), the Multidimensional Assessment of Fatigue (MAF), the Multidimensional Fatigue Inventory (MFI), the MFSI-SF, the Piper Fatigue Scale (PFS) and its short form, and the Schwartz Cancer Fatigue Scale (SCFS) and its short form.[12,13]

These nine instruments were evaluated and compared based on their study results (e.g., reliability, validity, and completion time) and study designs, including the characteristics of understudied populations and sample size. Two of the nine instruments (the FAQ and the MFSI-SF) have been evaluated in cancer patients in only one study. The sample sizes were too small to evaluate the construct validities of some instruments (e.g., 65 cancer patients for the FAQ and 57 patients with sleep disorders for the LFS).[15,16] The construct validity of the MAF was not supported by other psychometric testing studies.[17,18] The MFSI-SF and the PFS have too many items for cancer patients to complete. As for the MFI, the internal consistencies (Cronbach's alpha coefficients) of subscales varied from 0.43 to 0.93.[19] Therefore, the CFS,[20] the Schwartz Cancer Fatigue Scale-revised (SCFS-r),[21] and the FSI[22] were chosen in this study because they are brief (less than 20 items), easy to complete (less than 5 minutes), and had been tested in a sample of over 200 cancer patients with good reliability and validity.

Presently, CRF is still a relatively new research area in Taiwan. Many currently available instruments have had limited validity testing on this understudied population in Taiwan. The lack of a suitable tool for measuring fatigue has been a barrier to progress in the research of fatigue and to the assessment of fatigue in clinical settings. Therefore, the aims of this study were twofold: 1) to examine ease of use for the three instruments in Taiwanese cancer patients based on patients' self-report and completion rate, and 2) to evaluate the psychometric properties (reliability and factorial, convergent, divergent, and discriminant validity) of these three instruments in a Taiwanese cancer population.

Methods

Patients and Data Collection

Potential participants were recruited at one of the leading medical centers in northern Taiwan, the Chang-Gung Memorial Hospital, which has 3900 beds and a chemotherapy center at which any type of cancer outpatient receives chemotherapy treatment. About 500 persons per month receive chemotherapy treatment in this center.

Individuals eligible for this study had been diagnosed with cancer and were receiving