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Original Article

Reliability and validity of the Chinese version of the PedsQL Multidimensional Fatigue Scale in children with acute leukemia



Qimeng Ye ^a, Ke Liu ^{b,*}, Jun Wang ^b, Xiuqing Bu ^b, Lili Zhao ^a

^a Department of Biological Medicine, Beijing City University, Beijing, China

^b Department of Nursing, Sun Yat-sen University, Guangzhou, China

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ABSTRACT

Background: The PedsQL Multidimensional Fatigue Scale (PedsQL™ MFS) is widely used to rate fatigue in children living in English-speaking countries. However, insufficient instruments are available to conduct parallel assessment on fatigue in parents and children in China. In this regard, an appropriate measurement method must be developed.

Objectives: This study aims to determine the reliability and validity of the Chinese-language PedsQL™ MFS.

Methods: Children with cancer ($n = 125$) and their parents were surveyed in Guangzhou, China. The parents of children aged 2–4 years completed the PedsQL™ MFS proxy reports, whereas the other children and their parents completed the questionnaires by themselves. **Results:** The PedsQL™ MFS-Chinese version demonstrated satisfactory internal consistency reliability (child self-report Cronbach's $\alpha = 0.87$; parent self-report Cronbach's $\alpha = 0.93$). The factor loadings of the items ranged from 0.78 to 0.87 for general fatigue, 0.56–0.78 for sleep/rest fatigue, and 0.62–0.89 for cognitive fatigue.

Conclusion: This study proves that the PedsQL™ MFS-Chinese version is an effective tool for screening fatigue in Chinese children with cancer.

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1. Background

Acute leukemia is a type of cancer most common among children. The development of medicine has rendered this disease curable and has increased the survival rates of patients. However, the incidence rate and treatment-related side

effects (e.g., fatigue, pain, nausea, vomiting, and nutritional concerns) of leukemia have significantly increased [1,2].

Fatigue is the most common and distressing side effect during cancer treatment and has a profound influence on the activities of daily life of patients [3,4]. Up to 60–99% of cancer patients reported fatigue [3]. The National Comprehensive Cancer Network has defined fatigue as “a persistent,

* Corresponding author.

E-mail address: liuke@mail.sysu.edu.cn (K. Liu).

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subjective sense of tiredness related to cancer or cancer treatment that interferes with usual functioning” [5].

Scholars have given much attention to fatigue in children with cancer since the 1990s. Hockenberry-Eaton et al. [6] first evaluated fatigue as a symptom in children with cancer and provided the theoretical foundation for developing its conceptual model. Subsequent studies indicated that fatigue may influence children with cancer in different aspects, including both physical and psychosocial functioning. Fatigue also occurs in different phases of the treatment, such as during, at the end stage, or even after its completion [7,8].

Although most children with cancer are chronically fatigued, this phenomenon has not been given sufficient attention in China; one explanation could be that health professionals always place a high value on other cancer-related symptoms, such as nausea, vomiting, pain, and hair loss. Furthermore, children assumed that parents or healthcare providers could not help them and that fatigue is only a normal part of the disease progression. Some older children would rather manage fatigue by themselves than place a large burden on their parents [1,9]. Another explanation for this phenomenon is the absence of any uniform and well-developed Chinese instrument. A barrier exists in the clinical investigation of fatigue and in the clinical management of pediatric oncology patients in China. Hence, a reliable and valid instrument to measure fatigue in children with cancer and provide basic evidence for further research is needed.

There were not enough instruments that can measure the fatigue experienced by both parent and affected child in China are insufficient. Therefore, we aim to establish an appropriate measurement to evaluate fatigue.

The PedsQL™ Multidimensional Fatigue Scale (PedsQL™ MFS) is commonly used to assess fatigue in pediatric patients. This instrument was developed by Varni on the basis of the concept that disease-specific symptoms are causal indicators of generic health-related quality of life (HRQOL). PedsQL™ MFS was designed as a generic symptom-specific instrument to measure fatigue in pediatric patients aged 2–18 years from the perspective of the children, adolescents, and their parents [10].

The present study aims to evaluate the reliability and validity of the Chinese version of PedsQL™ MFS. We translated the PedsQL™ MFS and evaluated the psychometric properties in hospital-based clinical groups.

2. Materials and methods

2.1. Subjects

A cross-sectional descriptive study was employed. A total of 125 children with acute leukemia and their parents from the top three hospitals in Guangzhou were recruited through convenient sampling. Only children who had been diagnosed to have acute leukemia for 1 month at the least were included. Children who had developmental disorders or known psychiatric, neuromuscular, or other chronic diseases were excluded.

2.2. Measures

2.2.1. PedsQL™ MFS (Chinese version)

The PedsQL™ MFS developed by Dr. J.W. Varni comprises parallel child self-reports and parent proxy reports. Child self-reports were designed for children aged 5–7 (young child), 8–12 (child), and 13–18 years (adolescent). Parent proxy reports for children also include 2–4 years of age (toddler), and they are used to assess the parent's perception of their child's fatigue [11].

The instrument consists of 18 items and is divided into three subscales: (1) general fatigue (GF, six items, e.g., “I feel tired;” “I feel too tired to do things that I like to do”); (2) sleep/rest fatigue (SRF, six items, e.g., “I feel tired when I wake up in the morning;” “I rest a lot”); and (3) cognitive fatigue (CF, six items, e.g., “It is hard for me to keep my attention on things;” “It is hard for me to think quickly”). The participants were assessed on how often a particular problem occurred in the past month by using a five-point Likert scale from 0 to 4 (0 = never, 1 = almost never, 2 = sometimes, 3 = often, and 4 = almost always). Each item was reverse-scored and rescaled to 0–100 scale. Hence, a 4 in the Likert scale was transformed into a score of 0, and a 0 in the Likert scale was transformed into a score of 100; in short, higher scores indicate fewer symptoms of fatigue [12].

2.2.2. Translation/back-translation of the PedsQL™ MFS to Chinese version

The Chinese version was developed in the following phases in accordance with the suggested guidelines [13]. We contacted Dr. J.W. Varni, and he had authorized us to use and translate the PedsQL™ MFS into Chinese.

- (1) Forward translation (English–Chinese translation): Two bilingual translators whose mother language is Chinese and who are knowledgeable about pediatric nursing translated the original instrument to Chinese independently. Subsequently, a third independent Chinese translator compared the forward-translated versions, resolved ambiguities and discrepancies, and generated the initial translated version.
- (2) Back translation (Chinese–English translation): The initial translated version was translated back into English by another two bilingual translators whose mother language is English independently. A committee consisting of five translators and two nursing experts compared the back-translated version with the original instrument, and they also revised the contradictory items.
- (3) Pretest and cross-cultural adaptation: A total of 20 children and their parents whose language is Chinese were chosen to complete the Chinese version instrument; afterward, we adapted the ambiguities. Finally, we sent the final Chinese version to Dr. J.W. Varni.

2.3. Procedure

Each parent received a written document, including the Chinese versions of the PedsQL™ MFS and the PedsQL 3.0 Cancer Module, and all participants received oral and written explanations of the study. Researchers explained our procedure for

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