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Psychometric evaluation of a Chinese version of the Lee Fatigue Scale-Short Form in women during pregnancy and postpartum

Shao-Yu Tsai [a], Shiow-Ching Shun [a], Yeur-Hur Lai [a], Ya-Ling Lee [a], Shih-Yu Lee [b,*]

[a] Department of Nursing, National Taiwan University, Taipei, Taiwan
[b] Byrdine F. Lewis School of Nursing, Georgia State University, Atlanta, GA, USA

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ABSTRACT

Background: Fatigue is among the most prevalent and distressing symptoms in pregnant and postpartum women. Estimating fatigue severity with a psychometrically sound instrument provides the most fundamental information for understanding women's fatigue experience and assessing the need for intervention to improve maternal and infant health outcomes.
Objectives: To evaluate the psychometric properties of a Chinese version of the 7-item Lee Fatigue Scale-Short Form (C-LFS-SF) in pregnant and postpartum women.
Methods: The study was composed of two phases: translation of the scale into Chinese and examination of content validity, and testing to establish the reliability and validity. A convenience sample of 124 women completed health-related questionnaires, kept a fatigue diary and wore a wrist actigraph for 7 days during the third trimester of pregnancy and within three months postpartum.
Results: The C-LFS-SF showed satisfactory internal consistency (Cronbach's alpha $\geq .97$) and stability over the 7 days at each time point (intraclass correlation coefficient $> .87$). Exploratory factor analysis showed that 88–94% of the total variance was explained by the one-factor fatigue model. Significant associations among the C-LFS-SF and actigraphic sleep quantity and quality variables supported adequate construct validity.
Conclusions: The C-LFS-SF has satisfactory psychometric properties and is an easy and promising tool for assessing maternal fatigue during routine prenatal and postpartum care. This scale needs to be further tested in a more diverse population of pregnant and postpartum women, like women with high risk pregnancies or with medical conditions.

What is already known about the topic?

- Fatigue is among the most prevalent and distressing symptoms in pregnant and postpartum women, with up to 60–90% of women experiencing fatigue at some time during pregnancy or postpartum.
- Fatigue is a significant health issue because it is associated with increased maternal psychological symptoms during pregnancy, increased risks for cesarean deliveries, and a new onset of postpartum depressive symptoms.

What this paper adds

- The Chinese version of the Lee Fatigue Scale-Short Form (C-LFS-SF) has sound psychometric properties and is a promising tool for assessing fatigue in a rapid and

* Corresponding author at: Byrdine F. Lewis School of Nursing, Georgia State University, P.O. Box 4019, Atlanta, GA, USA. Tel.: +1 404 413 1176; fax: +1 404 413 1205.
E-mail addresses: stsai@ntu.edu.tw (S.-Y. Tsai), scshun@ntu.edu.tw (S.-C. Shun), laiyhwk@ntu.edu.tw (Y.-H. Lai), yallee@ntu.edu.tw (Y.-L. Lee), slee29@gsu.edu (S.-Y. Lee).

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quantitative manner during routine prenatal and postpartum care.
- The ability to detect changes suggests that potential uses of the C-LFS-SF include assessments of fatigue before and after interventions as an indication of the effectiveness of a therapy or coping strategy.

1. Background

Fatigue is among the most prevalent and distressing symptoms in pregnant and postpartum women, with up to 60–90% of women experiencing fatigue at some time during pregnancy or postpartum (McGovern et al., 2011; Reeves et al., 1991; Rodriguez et al., 2001). Fatigue during pregnancy and postpartum is a significant health issue because it affects both the mother and the infant in short-term and long-term outcomes (Corwin et al., 2005). Outcomes include, but are not limited to, increased psychological symptoms during pregnancy, increased risks for cesarean deliveries, and a new onset of postpartum depressive symptoms (Chien and Ko, 2004; Dennis and Ross, 2005; Reeves et al., 1991). Rather than self-limiting (Corwin and Arbour, 2007; Taylor and Johnson, 2010), fatigue can persist throughout pregnancy and continue up to 18 months after delivery (Elek et al., 1997; Lee and Zaffke, 1999; Parks et al., 1999). Prolonged and unresolved fatigue interferes with maternal capacity for infant-care activities and has been associated with poor maternal mental and physical health, delayed infant development, and more symptoms of infection in both mothers and infants (Groer et al., 2005; Parks et al., 1999; Pugh and Milligan, 1993). Estimating fatigue severity with a psychometrically sound instrument provides the most fundamental information for understanding women's fatigue experience and assessing the need for intervention to improve maternal and infant health outcomes (Dodd et al., 2001; Fairbrother et al., 2008; Tsai et al., 2012).

Fatigue has been defined as an overwhelming unpleasant feeling reflecting physiological, psychological, and potentially pathological state of exhaustion that decreases an individual's energy level and capacity for positive motor and cognitive performance and self-management abilities (Aaronson et al., 1999; Lerdal et al., 2011; Pugh and Milligan, 1993). Fatigue is a central component of nursing diagnosis and nursing care plans. Existing literature provides a theoretical framework and empirical basis for understanding childbearing and childrearing fatigue in women's lives (Lee et al., 1994; Pugh and Milligan, 1993; Runquist, 2007). In these models, fatigue develops when internal and external demand exceeds women's resources. During pregnancy, labor and delivery, and postpartum, there are multiple physiological, psychological and situational factors that predispose women to childbearing or childrearing fatigue along a continuum ranging from mild tiredness to severe exhaustion (Hall et al., 2009; Lee et al., 1994; Pugh and Milligan, 1993). For example, sleep disturbance is conceptualized as an internal environmental demand and a situational factor causing maternal fatigue in these models. Available data also confirm that fatigue during pregnancy and postpartum primarily results from insufficient or poor sleep (Insana et al., 2011; Rychnovsky and Hunter, 2009; Tsai et al., 2012).

Among the self-report instruments used to assess maternal fatigue, the Lee Fatigue Scale (LFS) is a reliable and validated instrument, and by far the most widely used for assessing diurnal fatigue patterns in both clinical and non-clinical samples of pregnant and postpartum women (Elek et al., 1997; Gay et al., 2004; Maloni and Park, 2005). This instrument was originally designed as a 100 mm visual analog scale with a 13-item fatigue subscale and 5-item energy subscale (Lee et al., 1991). For easier administration and scoring when fatigue is a dynamic phenomenon assessed repeatedly in relation to an event or time frame (Aaronson et al., 1999), the LFS was converted to a short form (LFS-SF) numeric rating scale for fatigue containing 7 items with answers ranging from 0 (not at all) to 10 (extremely) (Gay et al., 2004; Lee and Gay, 2004; Lee and Lee, 2007). Our preliminary work and that of others in Taiwan and United States has demonstrated satisfactory internal consistency with the Chinese version of the LFS-SF (C-LFS-SF) (Lee et al., 2005; Tang et al., 2010; Tsai et al., 2012). However, validity of the C-LFS-SF has not been reported. If the psychometric properties of the C-LFS-SF can be fully documented, international research collaborations and Chinese speaking health care professionals, as well as pregnant and postpartum women worldwide, can benefit from this very efficient and practical instrument.

The purposes of this study were to (a) report the translation and back translation of the C-LFS-SF, and (b) examine the reliability, validity and factor structure of the C-LFS-SF in Taiwanese pregnant and postpartum women.

2. Methods

2.1. Design

A two-phase process was implemented in developing and evaluating the C-LFS-SF. First, the scale was translated into Mandarin Chinese and the content validity was examined, and second, testing was conducted to establish the reliability and validity.

2.2. Phase 1: Translation, back-translation and evaluation of content validity

The translation theory (Chau, 1983; Kraszewski, 1998) and the recommended procedures for cross-cultural research (Brislin, 1970; Brislin et al., 1973) were used to forward-translate the LFS-SF into Mandarin Chinese and then back-translate using the 3-point criteria (described later) developed by Flaherty and colleagues (1988) to test the semantic and content equivalence of the original and translated version (Flaherty et al., 1988).

Two Chinese-American freelance translators first translated the LFS-SF separately and then cross-examined and revised it for the C-LFS-SF. This first version was evaluated by a panel of six committee members (6th and 7th grade Chinese language arts teachers) for content equivalence and the reading level of 5th to 6th grade. The final product from the committee's review became the C-LFS-SF version two. To ensure the semantic equivalence of the Mandarin