

## Validation of the Chinese-version MPSS-R for occupational stress among emergency nurses

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### Abstract

The aim of this study was to examine the reliability and validity of a Chinese-version stress instrument among emergency nurses. The study sample comprised of 113 nurses whose age ranged from 21 to 47 years old. The Chinese version of Medical Personnel Stress Survey (MPSS-R) was answered in 1996 through self-administered questionnaires. The instrument demonstrated excellent convergent and discriminant validity. Cronbach's  $\alpha$  (reliability) coefficients

ranged from .57 to .77. Factorial analysis yielded four principal components, corresponding to job dissatisfaction, team relationship, organization support, and somatic distress. Validation by independent variable was also consistent with theory. Thus, the Chinese-version MPSS-R retained excellent psychometric properties when used in an emergency nurses group. © 2001 Elsevier Science Inc. All rights reserved.

*Keywords:* Validation study; Occupational stress; Medical personnel stress survey; Chinese health questionnaire

### Introduction

There is much evidence that nursing is a rather stressful profession and that this stressful nature is a main cause of the turnover and shortages of professional nursing manpower encountered internationally [1–3]. Stress has been defined as the nonspecific response of the body to external stimulus [4]. It has been shown that work stressors are associated with decreased job performance [5], lower job satisfaction [6,7], and physical and mental health problems among nursing staff [7–9]. The stressors of the nursing profession can be attributed to the pressure of assuming responsibility for another's life, the contact with large number of patients, the risk of acquiring infection, and the scrutinization of job performance by bystanders and patients' relatives.

Most studies concerning the sources of occupational stress and its effects on nurses have placed their emphasis

on an individual level and have ignored organizational stress. However, the work environment has been demonstrated to be an important factor in both the development and prevention of burnout [10,11]. In order to measure stress experienced by nurses working in emergency environments, the Medical Personnel Stress Survey (MPSS-R) [12] was designed to assess key stressors both on the organizational and the individual levels. The MPSS-R measures four components of occupational stress: organizational stress, job dissatisfaction, negative patient attitudes, and somatic distress. Both the MPSS-R measures and its original version had proven to be valid in measuring the stress levels of the employees of general hospitals [12,13].

Previous studies indicate that inadequate language translation may lead to a reduction of the content validity of measurement [14,15], so it is necessary to validate the Chinese version of the MPSS-R before it is widely used. In the present study, our main objective was to ascertain the dimensionality of the Chinese version of MPSS-R and to provide estimates of reliability and evidence of its internal and construct validity among emergency nurses.

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We assessed evidence of construct validity for the Chinese version of MPSS-R following the logic proposed by Carmines and Zeller [16]. Construct validity is the extent to which a particular measure relates to other measures consistent with theoretically derived hypotheses concerning the concepts (or constructs) that are being measured. The theoretical relationship between stressors and mental health problems [9] was used as a guide to assess the construct validity of the Chinese version of MPSS-R. We hypothesized that individuals who were classified as having probable minor psychiatric illness would have higher level of stress than those who were not.

## Method

### *Study subjects*

The study sample was comprised of 113 emergency nurses whose ages ranged from 21 to 47 years old with a mean of 27.6 and a standard deviation of 5.4. Each study subject was given self-administered questionnaire to collect sociodemographic data, in addition to the Chinese Health Questionnaires (CHQ), and the revised Chinese version of MPSS-R. Of the 113 nurses, 36 (31.9%) were married and 77 (68.1%) were single. Twenty-nine (25.7%) had children. About 80% of study sample had more than 12 years of education.

### *Measurements*

#### *Stress*

Both individual and organizational stress was assessed using the revised Chinese version of MPSS-R, which was translated from the MPSS-R. The MPSS-R is a 40-item questionnaire with 10 items related to each of the four components of occupational stress: organizational stress, job dissatisfaction, negative patient attitudes, and somatic distress. Organizational stress involves peer relationships, support, and work climates. Job dissatisfaction is comprised of items exploring discontent with one's current position. The negative patient's attitudes component measures negative feelings about patients, including insensitivity to their physical and emotional needs and physically abusive encounters with patients. Somatic distress is characterized by psychological symptoms of severe or chronic stress, including fatigue, increased illness, self-medication to relax, and so on. The original MPSS-R is shown in Appendix A. The MPSS-R used a five-point Likert scale anchored at one end by "never or none," which is coded as 1, and at the other end by "nearly always or almost always," which is coded as 5. After reversing direction on those items with a negative value, scores were determined by adding the responses.

*Translation of the MPSS-R.* The original MPSS-R was translated by a group of four bilingual researchers in the fields of psychology, psychiatry, and physician specified in

emergency medicine who understood the intent of the measure and the concepts to be explored. Two preliminary Chinese versions were independently translated through a 6-month period. A committee then reviewed two versions of translation in order to produce one version. The review committee agreed upon a common version based on the following three criteria: (1) the original concepts should be reflected in the translation for conceptual equivalence; (2) the translation should be culturally adapted on items that are difficult to translate and involve common language; and (3) the translation should also be brief, familiar, and straight forward. Back-translations were performed after the iterative evaluation of forward translation process. Then, the Chinese translation was used among colleagues to examine its acceptability in order to produce the final version.

### *Mental health status*

Mental health status was measured using the CHQ-12, which consisted of 12 items with a four-point Likert scale. All responses are coded with values ranging from 0 ("not at all" and "as usual") to 1 ("more than usual" and "much more than usual"). The CHQ was used particularly as a screening test for minor psychiatric morbidity in the Chinese community and primary care settings. Previous studies have shown that the CHQ has high reliability (Cronbach's  $\alpha$  coefficients in community samples and hospital groups are .84 and .83, respectively) [17] and validity (the sensitivity and specificity were 78% and 77%, respectively) [18]. The CHQ-12 consisted of questions related to anxiety, depression, insomnia, fatigue, poor concentration and memory, social functioning, physical health, family relationship, and so on. The detailed description of CHQ-12 items was presented in Chong's work [18].

### *Validation method*

#### *Item analysis*

Item analysis is usually used to eliminate items, which lack of discriminating function as determined by their discriminatory power. There are three steps in calculating the discriminatory power for each item. First, an overall score for a respondent's answers is computed by adding the points of all items within a scale. Then, the mean score for each item is calculated for individuals having the first quartile of the overall score (Mean<sub>25%</sub>) and for individuals having the last quartile of the overall score (Mean<sub>75%</sub>). Finally, the discriminatory power for each item is calculated by subtracting the Mean<sub>25%</sub> from the Mean<sub>75%</sub>. In this study, we planned to eliminate 10 items with the smallest values of discriminatory power.

#### *Reliability*

Only the internal consistency form of reliability (Cronbach's  $\alpha$ ) was assessed in this study. The evaluation of the reliability of any measurement procedure consists of estimating how much of the variation in a score is real or true,

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