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Psychometric evaluation of a Chinese version of the Parental Stressor Scale: Paediatric Intensive Care Unit

Key Messages

1. Stress experienced by parents when their children are in a critical condition can threaten family functioning and influence the level of stress in the children themselves. It is important for health care practitioners to be cognizant of the nature, sources, and levels of parental stress so that they can reduce them to a minimum.
2. Further studies with larger samples are recommended to refine the instrument and evaluate the feasibility of reducing certain redundant items.

Introduction

More and more seriously ill children are being admitted to intensive care units due to advances in life-saving technology. As a result, feelings of anxiety and unexpected family problems may arise. Critical illness and accidents often occur without warning and there is little time for family members to prepare for this experience. Apart from the unpredictability of the immediate health outcomes of their sick child, parents often find their established parental roles altered, resulting in further anxiety and uncertainty. These are major psychosocial stressors for the family.[1,2]

A widely used instrument to measure parental stress in the paediatric intensive care unit (PICU) is the Parental Stressor Scale: Pediatric Intensive Care Unit (PSS:PICU) developed in the US.[3,4] There are 37 items in the scale, measuring seven dimensions of potential stressful stimuli for children hospitalised in a PICU. The seven dimensions are: child's appearance, sights and sounds, procedures, staff behaviour, parental role alteration, staff communication, and child's behaviour and emotions.

Aims and objectives

The aims of this study were to translate the PSS:PICU into Chinese, and evaluate the psychometric properties of the Chinese version and the feasibility of using it to assess parental stress in PICU in Hong Kong.

Methods

This study was conducted from October 2000 to May 2001. The PSS:PICU was translated into Chinese by the first author with the assistance of a bilingual registered nurse. It was then back-translated by another bilingual registered nurse who did not read the original English version. Discussion among the translators was used to resolve any unclear translations in order to improve the semantic equivalence of the translation.

Content validity of the translated instrument was established by calculating the inter-rater agreement and the content validity index among six experienced PICU nurses. A pilot study was performed and the parents reported no problem in understanding and completing the translated scale.

In the main study, parents with children admitted to the PICU who met the inclusion criteria were invited to participate in the study. Data were collected within 48 hours of the child's admission. Parents were requested to complete the Chinese version of the PSS:PICU, Spielberger State Anxiety Inventory, and a one-page demographic information sheet. Of four hospitals approached for the study, two gave permission to assess the parents in their PICU while the other two declined.

Results

A total of 192 children were admitted over the 5-month data collection period, of

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Table 1. Convergent validity of CPSS:PICU and C-SAI

Subscale	Pearson's correlation coefficient
1. Child's appearance	0.20
2. Sights and sounds	0.35*
3. Procedures	0.03
4. Staff behaviour	0.19
5. Parental role alteration	0.09
6. Staff communication	0.12
7. Child's behaviour and emotions	0.23†
Total CPSS:PICU score	0.23†

* P≤0.01
† P≤0.05

Table 2. Internal consistency of CPSS:PICU

Subscale	No. of items	Cronbach's alpha
1. Child's appearance	3	0.82
2. Sights and sounds	3	0.85
3. Procedures	6	0.82
4. Staff behaviour	4	0.72
5. Parental role alteration	6	0.79
6. Staff communication	5	0.83
7. Child's behaviour and emotions	10	0.95
Total CPSS:PICU score	37	0.94

which 184 were considered for the study. Eighty-one parents of 75 children returned the questionnaire.

Characteristics of the parents

Among the respondents, 46 were mothers and 35 were fathers of the sick child. The mean age was 33.4 years (range, 19-51 years). All except four respondents were married. Most (70%) parents had secondary school education. With respect to employment, 27.5% of respondents were office workers, 21.3% were blue-collar workers, 13.8% were either professionals or shop owners, and 37.5% were occupied with home duties.

Characteristics of the children

The mean age was 32.9 months (SD, 44.6 months; range, 1 month-14 years). Twenty-eight (37.3%) children were admitted with respiratory conditions, 21.3% neurologic, 12% gastrointestinal, 9.3% cardiac, and 4% orthopaedic. Thirty (40%) children were admitted following surgery for immediate postoperative observation. Length of stay ranged from 1 to 28 days (mean, 4.56 days; mode, 2 days).

Validity of the Chinese version of PSS:PICU (CPSS:PICU)

Factor analysis was initially planned to determine the nature and number of factors that could adequately explain the correlations among the responses to items of the instrument. It was abandoned because of the small sample size. It has been suggested that a sample size of at least 300 cases is required for factor analysis to be reliable.[5]

Convergent validity of the CPSS:PICU was tested with the Chinese version of Spielberger State Anxiety Inventory (C-SAI). It was hypothesised that parental stress brought on by the child's admission to the PICU would correlate positively with the state anxiety scores. Table 1 shows the Pearson's correlations between C-SAI and the subscale and the total score of CPSS:PICU. The strongest correlations with anxiety were found in the sights and sounds and child's behaviour and emotions subscales.

Reliability of the Chinese version of PSS:PICU (CPSS:PICU)

To examine the internal consistency of the scale, Cronbach's alpha coefficients were calculated for each subscale and for the total instrument. Table 2 presents the results of these analyses. The alpha coefficients were acceptable (>0.70) for all scales. The internal consistency for the entire scale (0.94) was good, indicating that the items are measuring the same characteristics in each dimension.

Table 3. CPSS:PICU subscale-to-total correlation coefficients

Subscale	1	2	3	4	5	6	7
1							
2	0.46*						
3	0.56*	0.42*					
4	0.20	0.13	0.14				
5	0.44*	0.22‡	0.46*	0.44*			
6	0.38†	0.26‡	0.36†	0.58*	0.65*		
7	0.49*	0.34†	0.36†	0.36†	0.48*	0.48*	
Total CPSS: PICU score	0.71*	0.52*	0.67*	0.54*	0.77*	0.74*	0.82*

* P≤0.001
† P≤0.01
‡ P≤0.05

Another approach to estimate reliability is to measure the degree of relationship between the subscale scores and the total scale. Evidence for the instrument's reliability was defined as coefficients higher than 0.40. As shown in Table 3, most of the subscales were moderately correlated with one another and strongly correlated with the total score, indicating that they share a great deal of their variance in common.

Discussion

The average time required to complete the Chinese version of the instrument was 20 minutes. Respondents found the items easy to understand and required no explanation to complete the scale.

The strength of the CPSS:PICU lies in the internal consistency of the scale as reflected by Cronbach's alpha. Each of the seven subscales exceeded the criteria of 0.70, with five of them over 0.80.

The high alpha value for the scale (0.94) suggests that there may be overlapping items. The high inter-item correlations among certain items tend to support this view. For example, parents in this study considered "Not being

able to visit my child when I wanted" and "Not being able to see my child when I wanted" as very closely related (r=0.85). These two items are contextually very similar in the Chinese language.

The convergent validity of the Chinese version was weak as reflected by the low correlations with the well-established state anxiety scores. Only the sights and sounds of the unit and the child's behaviour and emotions increased the anxiety of the parents. Further studies with larger samples are needed to refine the instrument and to evaluate the feasibility of reducing certain redundant items. It would be ideal if both Chinese and English versions of the instruments were administered to parents who could read and understand both languages so that more psychometric tests could be performed before the Chinese version becomes an acceptable tool.

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