Translation and validation of the PPSC-PNP instrument to measure parental satisfaction with care from pediatric nurses in China

Tian Lin [a,b], Hao-fei Qiu [a], Tao Zhang [b], Jiale Hu [c], Xiuqun Qin [d,*], Lifeng Zhang [e,**]

[a] School of Nursing, Guangdong Pharmaceutical University, Guangzhou, China
[b] School of Humanities and Social Sciences, Macao Polytechnic University, Rua de Luís Gonzaga Gomes, Macao
[c] Department of Nurse Anesthesia, College of Health Professions, Virginia Commonwealth University, USA
[d] Pediatric Medical Center, Third Affiliated Hospital of Sun Yat-sen University, Guangzhou, China
[e] School of Nursing, Sun Yat-sen University, Guangzhou, China

ARTICLE INFO

ABSTRACT

Purpose: To modify and translate the Parents' Perceptions of Satisfaction with Care from Pediatric Nurse Practitioners instrument into Chinese, culturally adapt and initially test it to assess parental satisfaction with care from all levels of pediatric nurses in a pediatric inpatient care context.

Design and methods: The instrument was translated and culturally adapted following a standardized guideline for the translation and cross-cultural adaptation of self-report measures. Content validity, discriminative validity, internal consistency and test-retest reliability were examined.

Results: Four main issues were identified in the translation and cultural adaptation stage. Modifications were therefore made to the Chinese Parents' Perceptions of Satisfaction with Care from Pediatric Nurses instrument. The item-level content validity indexes for the Chinese instrument ranged between 0.83 and 1.0. The Cronbach's alpha coefficient was 0.95, and the intra-class correlation coefficient for test-retest reliability was 0.44.

Conclusion: The Chinese Parents' Perceptions of Satisfaction with Care from Pediatric Nurses instrument has good content validity and internal consistency and can be considered a suitable clinical evaluation tool to measure parental satisfaction with care from pediatric nurses in pediatric inpatient settings in China.

Practice implications: The instrument is anticipated to be useful in strategic planning for Chinese nurse managers responsible for patient safety and quality of care. Additionally, it has the potential to serve as a tool to enable international comparisons in parental satisfaction with care from pediatric nurses after further testing.

© 2023 Published by Elsevier Inc.

Introduction

Patient satisfaction, as one of the quality indicators for patient-centered care (Anderson et al., 2019), is recognized as a gauge of patient outcomes (Topaz et al., 2016; Waldron, 2021). In pediatric care settings, children's illness or hospitalization is not only experienced by children themselves but also involves their parents, family members, or legal guardians as well (Cintra et al., 2022). Patient-centered care therefore needs to focus on family-centered care. The concept of patient satisfaction has correspondingly been extended to parental satisfaction or family satisfaction (Orive et al., 2018). Measuring parental satisfaction has long been a focus in pediatric inpatient care settings, where family members are highly involved with their hospitalized children's caring and healthcare decisions (Segers et al., 2019). This highlights the importance of measuring parental satisfaction of the healthcare received by children. Understanding and responding to feedback can lead to improved healthcare experiences for children and their families, contribute to healthcare quality improvement, and ultimately lead to improved patient outcomes (Lessa et al., 2020; Orive et al., 2018).

Numerous instruments have been developed and used to assess patient satisfaction (Almeida et al., 2015; Ng & BHK, 2019), and parental satisfaction with healthcare in pediatric healthcare settings, including in pediatric intensive care units (Latour et al., 2011; Lessa et al., 2020; McPherson et al., 2000; Orive et al., 2018), and neonatal intensive care units (Hagen et al., 2018; Latour et al., 2012; Sawyer et al., 2014). These instruments are generally long and focus on multiple aspects of patient satisfaction, such as healthcare organization, healthcare facilities, visiting scheduling and quantity, food quality, parental participation in care, parents' anxiety, clinical staff's services and non-clinical

* Corresponding author at: Third Affiliated Hospital of Sun Yat-sen University, 600 Tianhe Road, Tianhe District, Guangzhou, China.
** Corresponding author at: School of Nursing, Sun Yat-sen University, 74 Zhongshan Er Road, Guangzhou, China.
E-mail addresses: qinxq@mail.sysu.edu.cn (X. Qin), zhlfeng@mail.sysu.edu.cn (L. Zhang).
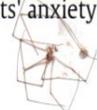
staff's efficiency and availability (Almeida et al., 2015; Batbaatar et al., 2017; Ferreira et al., 2021; Garratt et al., 2007; Toomey et al., 2015; Ygge & Arnetz, 2001).

Nevertheless, none of these instruments were designed specifically for measuring parental satisfaction with care from pediatric nurses, a most essential and indispensable component of overall satisfaction with healthcare (Bjertnaes et al., 2012; Hagen et al., 2018; Tsironi & Koulierakis, 2019). Nurses, play a crucial role in providing round the clock care in hospitals, and the quality of nursing has been emphasized as one of the most influential determinants of parents' satisfaction (Hagen et al., 2018). It is well-established in the literature that poor nursing care has been associated with adverse patient outcomes and patient safety issues (Liu et al., 2018; Recio-Saucedo et al., 2018; Suhonen et al., 2018). Measuring parental satisfaction with nursing care from pediatric nurses in pediatric inpatient care settings is therefore important. As such, a valid and reliable tool is required to assess parental satisfaction with nursing care.

In 2014, Kinder and Allen (2014) developed an instrument of Parents' Perceptions of Satisfaction with Care from Pediatric Nurse Practitioners (PPSC-PNP). This tool was originally developed by adapting three existing instruments (Kinder & Allen, 2014): the Satisfaction with Decision Scale (Holmes-Rovner et al., 1996), the Client Satisfaction Tool (Bear & Bowers, 1998), and the Nurse Practitioner Survey (Agosta, 2009). The PPSC-PNP instrument is composed of 28 items with a five-point Likert scale ranging from one (strongly disagree) to five (strongly agree). The overall score ranges from 28 to 140, with a higher score indicating a higher level of perceived satisfaction with PNP care. It was initially validated in primary pediatric practice settings, revealing a good content validity index of 0.81 and a Cronbach's internal consistency reliability of 0.98 (Kinder & Allen, 2014). The instrument has four conceptual sub-scales: communication skills, clinical competence, caring behavior, and decisional control. These sub-scales correspond to four elements of client-professional interaction in Cox (1982) Model of Client Health Behavior, which were considered as the basis for understanding patient satisfaction (Agosta, 2009). These four components play essential roles in the interaction between pediatric nurses and children's parents during their hospitalization.We, therefore planned to introduce the instrument into China to assess parental satisfaction with care, where no tools have existed so far in this respect. We aimed to translate the PPSC-PNP into Chinese, culturally adapt and initially test it to assess parental satisfaction with care from all levels of pediatric nurses in a pediatric inpatient care context. The study was a part of a larger project aimed at understanding the relationship between parental satisfaction and pediatric nurses' job satisfaction and intent to leave.

Methods

This study followed a standardized process from the translation and cross-cultural adaptation guideline of self-report measures (Beaton et al., 2000). It was performed with two stages: translation and cultural adaptation and psychometric testing.

Stage I: Translation and cultural adaptation

Step 1: Forward translation

Forward translation from the source language (English) to the target language (Chinese) was conducted by two bilingual translators who had experience living in China and Western countries. One translator (T1) was both a registered pediatric nurse and a nursing teacher working at a medical university in China with two-year experience studying in the United States of America. The another (T2) was a certified Chinese and English translator who studied in Canada for one year. The two translators independently produced a Chinese version of the PPSC-PNP and a detailed description of potentially challenging concepts and phrases.

Step 2: Synthesis of the translations

The two translators (T1 and T2) and one research coordinator (performed as a recording observer) compared the two Chinese PPSC-PNP versions. They worked together to produce a common translation version T-12 by examining and reconciling discrepancies between words, sentences and meanings.

Step 3: Back translation

The common translation version T-12 of PPSC-PNP was then translated back into English by two independent translators without a medical background, who were blind to the original version and not informed of the concepts in the questionnaire. A meeting was held following back translation, in which the two translators and the previous research coordinator discussed the two back translation versions to examine whether there were conceptual errors or gross inconsistencies in the translation. After the meeting, a document package was created, including the original English PPSC-PNP, two forward Chinese versions, the T-12 version, two back translation versions, and corresponding written reports recording issues during the translation process.

Step 4: Expert committee

This step involved an expert committee comprising one methodologist, who is experienced in translation and cross-cultural adaptation of questionnaires, one senior pediatric nurse, one nurse researcher, one language professional, and the forward and back translators. They reviewed all the materials in the document package and made critical decisions to achieve equivalence between the original English and target Chinese versions in four areas (Guillemin et al., 1993). These included: whether the translation 1) correctly represented the intended English meaning (semantic equivalence); 2) formulated an equivalent expression (idiomatic equivalence); 3) was accepted by target Chinese respondents (experiential equivalence); and 4) was conceptually understood in the context of the Chinese nursing profession (conceptual equivalence). Discrepancies were resolved by discussion or contacting the tool developer until an agreement was reached.

Step 5: Test of the pre-final version

In February 2019, the pre-final Chinese version was pretested in a convenience sample of 18 participants, based on the recommendations of having a sample size of 10–40 participants (Beaton et al., 2000; Sousa & Rojjanasrirat, 2011). The participants were parents of pediatric patients hospitalized in a pediatric ward in Guangzhou, China. They were asked to read all the items of the pre-final version and to provide open-ended comments regarding each item. This face-to-face pretest interview was undertaken for approximately 15 min for each participant. All the responses or comments were carefully recorded.

Step 6: Final version

After reviewing the comments obtained from the pretest, the expert committee made some modifications to the Chinese version. The final version is presented in Online Appendix.

Stage II: Psychometric testing

Sample and setting

By convenient sampling, participants were consecutively recruited in pediatric inpatient wards in two hospitals in Guangzhou, China. The sample size calculation was based on the recommendations of at least five respondents per item for psychometric testing studies (MacCallum et al., 1996). A target sample of 150 participants were invited to participate in the survey, with an estimated response rate of approximately 90%. Participants were included if: they were family members (parents, principal caregivers, or legal guardians) of hospitalized pediatric patients aged between 28 days and 14 years, with a minimum of three-day hospital duration; able to spend at least four hours/day with their hospitalized child and able to actively participate

in the child's care and healthcare decisions. Participants with literacy difficulties were excluded as they may not have been able to read or understand the questionnaire.

Data collection

Data collection was conducted by a trained investigator between July 2019 and January 2020. The investigator screened eligible participants and explained the purpose of the study. Once informed consent was obtained, participants were asked to complete the questions on the printed questionnaires independently. The whole procedure took approximately five to ten mins for each participant.

Data analysis

Data analysis was conducted using SPSS 24.0 (IBM Corp, 2016, Armonk, N.Y., USA). Validity was tested with content validity and discriminative validity. Content validity (including conceptual relevancy and language relevancy) was assessed by experts using a 4-point Likert scale (1 = not relevant, 2 = somewhat relevant, 3 = quite relevant, 4 = highly relevant). Indexes included in the analysis were: item-level content validity index (I-CVI: percentage of experts rating an item with "3" or "4"), scale-level CVI/averaging calculation (S-CVI/Ave: mean of the I-CVIs for all items on the scale) and scale-level CVI/universal agreement calculation (S-CVI/UA: percentage of items on a scale rated with "3" or "4" by all experts) (Polit et al., 2007; Polit & Beck, 2006). The acceptable standard for I-CVI is 0.78 and above, with more than five experts (Polit & Beck, 2006). For the values of S-CVI/UA and S-CVI/Ave, >0.8 is reckoned as satisfactory (Polit & Beck, 2006), with >0.9 indicating excellent content validity (Holle et al., 2014). The inter-rater reliability was evaluated by the intra-class correlation coefficient (ICC) based on a mean-rating (k = 6), absolute-agreement, 2-way random-effects model (Portney & Watkins, 2000), with values based on the 95% confident interval of the ICC estimate <0.5 indicative of poor reliability; ≥ 0.5 and < 0.75, ≥ 0.75 and < 0.9, > 0.90, indicating moderate, good, and excellent reliability, respectively (Koo & Li, 2016). The discriminative validity was evaluated by comparing the average questionnaire scores between the high and low groups by using an independent samples t-test (Kelley, 1939).

Reliability was tested with item-to-total correlations, internal consistency, and test-retest reliability. The item-total correlations were estimated by using Pearson's correlation coefficient, with values >0.4 being considered satisfactory (Ware & Gandek, 1998). Cronbach's alpha and split-half reliability were measured to demonstrate the instrument's internal consistency, and Cronbach's alpha values >0.70 and split-half reliability >0.80 were considered good reliability (Burns et al., 2011; Streiner et al., 2015

For the test-retest, the same printed questionnaires were distributed to participants who completed the initial test two weeks ago. During the retest stage, their children were still not discharged from hospital. The sample size (20 participants) for retest was calculated based on the formula of the ICC test, with an expected value of the ICC at 0.6 (Bujang & Baharum, 2017). The ICC based on a mean-rating (k = 2), absolute-agreement, 2-way mixed-effects model was employed (Portney & Watkins, 2000).

Ethical considerations

The ethics committee of the hospital approved the study. Permission to translate the PPSC-PNP into Chinese was obtained from the original instrument developer. In line with the Standards and Operational Guidance for the Ethical Review of Health-related Research with Human Participants (World Health Organization, 2011), the purpose of the study was clearly explained to the participants by an investigator who was not part of the clinical care team. Participation was voluntary and all participants were informed of the right to withdraw from the study without any consequences at any time. Confidentiality was guaranteed, with no names or personal information written on the printed questionnaires.

Results

Stage I: Translation and cultural adaptation

Forward and back translation

The two forward Chinese translation versions had six identical items and 12 similar items, which were considered proper translations, and not edited as such. After discussion, the remaining ten items with significant disparities were reconciled by adopting four preferable items in T1 and six in T2. In both two translations, the word "PNP" was changed to "pediatric nurse" and abbreviated into "nurse" on the questionnaire. During the back translation, five items in BT1 and seven items in BT2 were the same as or similar to the original questionnaire except for the word "PNP." Apart from the 12 items, there were ten similar items between the two back translation versions. The remaining six items with difference were resolved by adopting translations from BT1, resulting in a final back translation version after discussion. The most challenging words and phrases during forward and back translation are shown in Table 1.

Expert committee and pre-testing

One issue was identified in the first expert committee conference (see Table 1). The experts found the ninth item, 'I would not schedule appointments with the PNP (nurse) in the future,' was not conceptually appropriate in the Chinese nursing context as this study focused on all pediatric nurses, not only pediatric nurse practitioners. Chinese pediatric nurses do not provide independent or outpatient treatment for children. This item was therefore deleted from the questionnaire after the first expert committee conference.

Three issues were detected in the pre-testing stage (see Table 1). These were: 1) difficulties in understanding item 7, 'I was satisfied that my decision was aligned with my personal values; 2) unable to discriminate 'treatment options' in item 13 and 'health care decisions' in item 25; and 3) confusions in expressions of 'what PNP (nurse) explained to me' (item 20) and 'what PNP (nurse) taught me' (item 21). In these last two cases, participants felt explanation and teaching meant the same thing. These three issues were resolved by contacting the instrument author with the subsequent decision by the expert committee to add words and phrases to help participants understand the items. For instance, 'personal values' in item 7 was explained by helping patients with pain, clear communication, and religious values; 'treatment options' in item 13 was explained by different ways of managing an illness, and 'health care decisions' in item 25 by choices of diet,

Table 1
Results of translation and cultural adaptation.

Steps	Identified issues
Forward translation	Ten different items between T1 and T2; Challenging words or phrases: 'knowledgeable about health problems' (item 4); 'listen to what I had to say' (item 11), 'refer to a physician' (item 19).
Back translation	Six different items between BT1 or BT2 and original instrument; Challenging words or phrases: 'interested in child's health concerns' (item 2), 'knowledge in health issues was current' (item 6), 'show caring behavior' (item 17).
Expert committee	One conceptual equivalence issue (item 9): 'I would not schedule appointments with the nurse in the future'.
Pre-testing	Three pieces of feedback from children's parents: 1) difficulty in understanding item 7, 'I was satisfied that my decision was aligned with my personal values'; 2) difficulty in discriminating words of 'treatment options' (item 13) and 'health care decisions' (item 25); 3) difficulty in understanding the difference between 'what nurse explained to me' (item 20) and 'what nurse taught me' (item 21).

Abbreviations: T: translation; BT: back translation.

exercises. For the third question, it was resolved by merging items 20 and 21 into one item, i.e., 'what PNP (nurse) taught and explained to me'.

Finally, the English version of the PPSC-PNP was translated into Chinese with a Chinese name of Parents' Perceptions of Satisfaction with Care from Pediatric Nurses. It consists of 26 items, including three items measuring general satisfaction and 23 items (four sub-scales, consistent with the original instrument) measuring: communication skills (5 items), clinical competence (6 items), caring behavior (6 items), and decisional control (6 items). The sum of the 26 items ranges from 26 to 130, with each sub-scale ranging from 5 or 6 to 25 or 30.

Stage II: Psychometric testing

Sample analysis

A total of 150 participating family members of inpatient children completed the final questionnaire. Fourteen participants were excluded because their questionnaires were incomplete or invalid resulting in 136 complete responses. Twenty participants took part in the retest two weeks after the first testing.

Characteristics of the pediatric patients and their family are presented in Table 2. Most of questionnaires (82, 60.3%) were completed by mothers, 41 (30.1%) by fathers and 13 (9.6%) by grandparents. The median age of the pediatric patients was 3 years (interquartile range [IQR], 1, 6). The median length of hospital stay was seven days (IQR, 4, 13).

Content validity

The content validity was evaluated by six experts (two senior pediatric nurses, two pediatric nurse managers, and two pediatric nurse researchers). The I-CVIs for the scale's conceptual relevancy and language relevancy ranged between 0.83 and 1.0. The S-CVI/Ave and S-CVI/UA were 0.98 and 0.92 for conceptual relevancy and 0.96 and 0.85 for language relevancy, respectively (see Table 3). These results indicated good content validity of the instrument. The ICCs based on the 95% confidence interval were larger than 0.75 for conceptual relevancy, suggesting good inter-rater reliability, and lager than 0.5 for language relevancy showing the amount of agreement among the experts is moderate (Koo & Li, 2016) (see Table 3).

Discriminative validity

The discriminative validity was carried out by comparing scores of the scale and four sub-scales between a high score group (the first 27%, ≥116 points) and a low score group (the last 27%, ≤104 points) (Kelley, 1939). The differences among all the scores were statistically significant, with the difference in the total score between the two groups being 23.34 ± 1.36 ($t = -17.18$, df = 78, $P < 0.001$).

Reliability

All 26 items of the scale were correlated to the total score (correlation coefficient range, 0.42–0.78, $p = 0.00$) (see Table 4). The Cronbach's alpha coefficients were 0.95 for the scale and 0.73 to 0.83 for the four sub-scales (see Table 4). The split-half reliability coefficient was 0.91, also showing good internal consistency of the scale. For the test-retest reliability, the ICCs based on the 95% confidence interval for the scale was smaller than 0.5, indicating poor test-retest reliability (Koo & Li, 2016) (see Table 4).

Discussion

The study reported the process of translation and cultural adaptation of the PPSC-PNP instrument to measure parental satisfaction with care from pediatric nurses in pediatric inpatient settings in China. It followed the standardized method, ensuing high-quality translation and adaptation, and laid a good foundation for subsequent psychometric testing (Streiner, 2008).

During the forward and back translation stage, we did not find many difficulties that many other researchers have encountered in questionnaire translation in matching equivalent words from target language (Hu et al., 2019; Lessa et al., 2020). This might be because the original English questionnaire of PPSC-PNP was written in simple plain language without English idioms or slang words and the medical words in the questionnaire were easily understood by translators with and without a medical background. However, most participants in the pilot survey reported difficulties in differentiating words in different items, which they felt meant the same thing. For example, 'treatment options' and 'healthcare decisions'; 'what nurse explained to me' and 'what nurse taught me'. In addition, half of the participants did not understand what the term 'personal value' meant. These issues posed a challenge for us, which were not able to resolve by consensus in the expert committee conference. We finally sought help from the original instrument developer and obtained detailed explanations of these words or phrases. These explanations were added to certain items to support understanding for participants. We recognized the vital role of communication with instrument developers in questionnaire translation studies, which was also confirmed by other researchers (Hu et al., 2019, 2021).

Another challenge we faced was to adapt the survey to fulfill our study purpose of assessing parental satisfaction with care from all levels of pediatric nurses, as the PPSC-PNP was originally developed to measure parental satisfaction with care from PNP. We initially contacted the instrument developer and acquired confirmation of the suitability.

Table 2
Characteristics of the study participants ($n = 136$).

Characteristics of family members	n (%)	Characteristics of patient	n (%)
Relationship with child		Age (years) Median (IQR)	3 (1,6)
Mother	82 (60.3%)	Age (years) categories	
Father	41 (30.1%)	< 1	54 (39.7%)
Grandfather/mother	13 (9.6%)	1-	27 (19.8%)
Age (Mean ± SD)	35.73 ± 9.26	3-	37 (27.2%)
Education		> 7	18 (13.2%)
High school and below	58 (42.6%)	Gender	
Diploma	55 (40.5%)	Male	85 (62.5%)
Bachelor and above	23 (16.9%)	Female	51 (37.5%)
Employment status		Length of stay (days) Median (IQR)	7(4, 13)
Employed (including free job)	78 (57.4%)	Length of stay (days) categories	
Unemployed (housewives, the retired, farmers)	58 (42.6%)	1–7	69 (50.7%)
Family income (Monthly, Chinese yuan)		8–14	39 (28.7%)
<5000	65 (47.8%)	>14	28 (20.6%)
5000-	38 (27.9%)	Type of disease	
≥10,000	33 (24.3%)	Internal	75 (55.2%)
		Surgical	61 (44.8%)

Abbreviations: IQR: interquartile range.

Table 3

Content analysis of the Chinese Parents' Perceptions of Satisfaction with Care from Pediatric Nurses.

Items, sub-scales and total	Conceptual relevancy		Language relevancy	
	Number of "3" and "4"	I-CVI	Number of "3" and "4"	I-CVI
Communication				
1. Nurse explained things in an understandable manner	6	1.00	6	1.00
2. I am satisfied that I am adequately informed about the issues important to my decision for my child's health	5	0.83	6	1.00
3. Nurse listened to what I had to say about my child.	6	1.00	6	1.00
4. I understood what the nurse explained to me and taught me	6	1.00	6	1.00
5. Nurse discussed treatments plans with expert knowledge	6	1.00	6	1.00
Clinical competence				
6. Nurse performed procedures skillfully	6	1.00	6	1.00
7. Nurse was knowledgeable about health problems.	6	1.00	6	1.00
8. Nurse's knowledge in health issues was current.	5	0.83	5	0.83
9. I felt the nurse was competent with my child	6	1.00	6	1.00
10. Nurse knew when to refer to or consult with a physician	6	1.00	6	1.00
11. Nurse was a skilled provider for my child	6	1.00	6	1.00
Caring behaviors				
12. Nurse was respectful with me and my child.	6	1.00	6	1.00
13. Nurse was interested in my child's health concerns.	6	1.00	6	1.00
14. I was satisfied with how the nurse treated me and my child.	6	1.00	6	1.00
15. I felt like I can call the nurse with health issues and get attention.	6	1.00	6	1.00
16. Nurse showed caring behavior toward me and my child.	6	1.00	6	1.00
17. Nurse showed empathy for my child	6	1.00	5	0.83
Decisional control				
18. I was satisfied that my decision was consistent with my personal values	6	1.00	6	1.00
19. I was included in decision making for my child	6	1.00	6	1.00
20. Nurse helped me to decide health options for my child	6	1.00	5	0.83
21. The health care decision I made was the best decision possible for my child	5	0.83	5	0.83
22. Nurse helped me with health decisions for my child	6	1.00	5	0.83
23. I am satisfied with my health care decision for my child	6	1.00	6	1.00
General satisfaction				
24. I was satisfied with the amount of time the nurse spent with me.	6	1.00	6	1.00
25. Overall I was satisfied with the nursing care	6	1.00	6	1.00
26. I would likely recommend the nurse to others	6	1.00	6	1.00
Over satisfaction(total)	S-CVI/Ave = 0.98		S-CVI/Ave = 0.96	
	S-CVI/UA = 0.92		S-CVI/UA = 0.85	
	ICC (95% CI)		ICC (95% CI)	
	0.87 (0.78, 0.93)		0.71 (0.51, 0.85)	

Note: 3 = quite relevant, 4 = highly relevant.

Abbreviations: CI: Confidence Interval; ICC: intra-class correlation coefficient; I-CVI: item-level content validity index; S-CVI/Ave: scale-level CVI/averaging calculation; S-CVI/UA: scale-level CVI/universal agreement calculation.

Table 4

Reliability analysis of the Chinese Parents' Perceptions of Satisfaction with Care from Pediatric Nurses.

Items, sub-scales and total	Item-total correlation	Cronbach's α	Items, sub-scales and total	Item-total correlation	Cronbach's α
Communication		0.82	Clinical competence		0.74
Item 1	0.62**		Item 6	0.49**	
Item 2	0.63**		Item 7	0.59**	
Item 3	0.70**		Item 8	0.57**	
Item 4	0.78**		Item 9	0.63**	
Item 5	0.69**		Item 10	0.69**	
Caring behaviors		0.83	Item 11	0.57**	
Item 12	0.65**		Decisional control		0.73
Item 13	0.72**		Item 18	0.61**	
Item 14	0.70**		Item 19	0.53**	
Item 15	0.59**		Item 20	0.64**	
Item 16	0.71**		Item 21	0.42**	
Item 17	0.73**		Item 22	0.63**	
General satisfaction			Item 23	0.70**	
Item 24	0.73**				
Item 25	0.73**				
Item 26	0.65**				
Over satisfaction(total)		0.95	ICC (95% CI) 0.44 (0.24, 0.70)*		

Abbreviation: CI: Confidence Interval; ICC: intra-class correlation coefficient.

* P < 0.05.

** P < 0.01.

We then scrupulously examined every single item to consider whether it falls into the scope of pediatric nurses' practice. We determined that one item needed to be deleted; 'scheduling appointment with PNP (pediatric nurse)' as making appointments independently of a physician did not fit in pediatric nurses' work in China. Additionally, during content validity testing, special attention was paid to feedback on our open question regarding the content relevance of items from the experts. We received high scores of I-CVIs, S-CVI/Aves, and S-CVI/UAs, demonstrating excellent relevance, with no comments on inappropriateness of any item. These results suggest that the adapted questionnaire is an appropriate tool to evaluate parental satisfaction with care from pediatric nurses.

The results of item-total correlation and internal consistency also indicated good reliability of the questionnaire, aligning with the results in the original instrument testing (Kinder & Allen, 2014). However, the results of ICCs showed that the instrument had poor test-retest reliability. This might be explained by the fact that the re-testing was performed with families of the children two weeks after the original testing when most of the children were recovered and being prepared for discharge. The length of hospital stay and children's illness condition have been recognized as factors associated with parents' satisfaction with healthcare (Abuqamar et al., 2016; Hagen et al., 2019; Tsironi & Koulierakis, 2019). Although adequate test-retest reliability is needed to show that repeated use of a self-administered scale in the same participants may yield similar results (Leppink & Pérez-Fuster, 2017), it

should not be over-emphasized when the measured variable is subject to changes from one time to the next.

Despite the aforementioned poor test-retest reliability, the Chinese Parents' Perceptions of Satisfaction with Care from Pediatric Nurses instrument is an appropriate tool to measure parental satisfaction with care from pediatric nurses in pediatric inpatient settings in China. The instrument is anticipated to be useful in strategic planning for Chinese nurse managers responsible for patient safety and quality of care. Additionally, it has the potential to serve as a tool to enable international comparisons in parental satisfaction with care from pediatric nurses after further testing.

Limitations

The study has several limitations. Firstly, the study was conducted in two hospitals in one city, one of the most developed cities in China, with relatively abundant nursing human resources. The findings may therefore not be generalizable in other hospitals in different cities in China. Secondly, though families, the end users of the instrument, were involved in the pre-testing stage during the translation process, the content analysis did not include families and was instead performed with the pediatric nursing staff. Thirdly, factor analysis was not conducted to assess the underlying structure of the tool, which may affect the credibility of the psychometric testing results. However, our research emphasized translating the PPSC-PNP instrument to measure parental satisfaction with care from pediatric nurses instead of PNP. Therefore, we chose pediatric nursing staff for content rating and stressed more about the content analysis process. The research purpose has been achieved based on the study's results.

Conclusions

The Chinese Parents' Perceptions of Satisfaction with Care from Pediatric Nurses instrument translated from the PPSC-PNP has good content validity and internal consistency. It is a suitable clinical evaluation tool that can be used to measure parental satisfaction with care from pediatric nurses in pediatric inpatient settings in China. Further studies that refine the instrument and evaluate its psychometric properties, including factor analysis in diverse populations, are warranted.

Funding

CRediT authorship contribution statement

Tian Lin: Conceptualization, Methodology, Formal analysis, Writing – original draft. **Hao-fei Qiu:** Investigation, Resources, Formal analysis. **Tao Zhang:** Formal analysis, Data curation, Writing – review & editing. **Jiale Hu:** Methodology, Writing – review & editing. **Xiuqun Qin:** Conceptualization, Investigation, Resources, Project administration. **Lifeng Zhang:** Conceptualization, Methodology, Resources, Writing – review & editing, Supervision, Funding acquisition.

Declaration of Competing Interest

The authors declare that they have no conflicts of interest.

Acknowledgments

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.pedn.2023.02.003.

References

Abuqamar, M., Arabiat, D. H., & Holmes, S. (2016). Parents' perceived satisfaction of care, communication and environment of the pediatric intensive care units at a tertiary children's hospital. *Journal of Pediatric Nursing, 31*(3), e177–e184.

Agosta, L. (2009). Psychometric evaluation of the nurse practitioner survey. *Journal of Nursing Measurement, 17*, 114–133.

Almeida, R. S. D., Bourliataux-Lajoinie, S., & Martins, M. (2015). Satisfaction measurement instruments for healthcare service users: A systematic review. *Cadernos De Saude Publica, 31*, 11–25.

Anderson, A. C., Akre, E., & Chen, J. (2019). Exploring national trends of patient-and family-centered care among US children. *Journal of Child Health Care, 23*(2), 200–212.

Batbaatar, E., Dorjdagva, J., Luvsannyam, A., Savino, M. M., & Amenta, P. (2017). Determinants of patient satisfaction: A systematic review. *Perspectives in Public Health, 137*(2), 89–101.

Bear, M., & Bowers, C. (1998). Using a nursing framework to measure client satisfaction at a nurse managed clinic. *Public Health Nursing, 15*, 50–59.

Beaton, D. E., Bombardier, C., Guillemin, F., & Ferraz, M. B. (2000). Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine, 25*(24), 3186–3191. https://doi.org/10.1097/00007632-200012150-00014.

Bjertnaes, O. A., Sjetne, I. S., & Iversen, H. H. (2012). Overall patient satisfaction with hospitals: Effects of patient-reported experiences and fulfillment of expectations. *BMJ Quality and Safety, 21*(1), 39.

Bujang, M. A., & Baharum, N. (2017). A simplified guide to determination of sample size requirements for estimating the value of intraclass correlation coefficient: A review. *Archives of Orofacial Sciences, 12*(1).

Burns, N., Grove, S., & Gray, J. (2011). *Understanding nursing research: Building an evidence-based practice* (5th ed.). St Louis, MO: Elsevier Saunders.

Cintra, C. D. C., Garcia, P. C. R., Brandi, S., Crestani, F., Lessa, A. R. D., & Cunha, M. L. D. R. (2022). Parents' satisfaction with care in pediatric intensive care units. *Revista Gaúcha de Enfermagem, 43*.

Cox, C. L. (1982). An interaction model of client health behavior: Theoretical prescription for nursing. *ANS. Advances in Nursing Science, 5*(1), 41–56. https://doi.org/10.1097/00012272-198210000-00007.

Ferreira, D. C., Marques, R. C., Nunes, A. M., & Figueira, J. R. (2021). Customers satisfaction in pediatric inpatient services: A multiple criteria satisfaction analysis. *Socio-Economic Planning Sciences, 78*, Article 101036.

Garratt, A. M., Bjertnæs, A., & Barlinn, J. (2007). Parent experiences of paediatric care (PEPC) questionnaire: Reliability and validity following a national survey. *Acta Paediatrica, 96*(2), 246–252.

Guillemin, F., Bombardier, C., & Beaton, D. (1993). Cross-cultural adaptation of health-related quality of life measures: Literature review and proposed guidelines. *Journal of Clinical Epidemiology, 46*(12), 1417–1432.

Hagen, I. H., Iversen, V. C., Nesset, E., Orner, R., & Svindseth, M. F. (2019). Parental satisfaction with neonatal intensive care units: A quantitative cross-sectional study. *BMC Health Services Research, 19*(1), 1–12.

Hagen, I. H., Svindseth, M. F., Nesset, E., Orner, R., & Iversen, V. C. (2018). Validation of the Neonatal Satisfaction Survey (NSS-8) in six Norwegian neonatal intensive care units: A quantitative cross-sectional study. *BMC Health Services Research, 18*(1), 1–12.

Holle, D., Roes, M., Buscher, I., Reuther, S., Muller, R., & Halek, M. (2014). Process evaluation of the implementation of dementia-specific case conferences in nursing homes (FallDem): Study protocol for a randomized controlled trial. *Trials, 15*, 485.

Holmes-Rovner, M., Kroll, J., Schmitt, N., Rovner, D., Breer, L., Rothert, M., & Talarczyk, G. (1996). Patient satisfaction with health care decisions: The satisfaction with decision scale. *Medical Decision Making, 16*, 58–64.

Hu, J., Gifford, W., Ruan, H., Harrison, D., Li, Q., Ehrhart, M. G., & Aarons, G. A. (2019). Translation and linguistic validation of the implementation leadership scale in Chinese nursing context. *Journal of Nursing Management, 27*(5), 1030–1038.

Hu, J., Gifford, W., Ruan, H., Harrison, D., Li, Q., Ehrhart, M. G., & Aarons, G. A. (2021). Validating the Implementation Leadership Scale in Chinese nursing context: A cross-sectional study. *Nursing Open, 8*(6), 3420–3429.

IBM Corp (2016). *IBM SPSS statistics for windows, version 24.0.* Armonk, NY: IBM Corp.

Kelley, T. L. (1939). The selection of upper and lower groups for the validation of test items. *Journal of Education & Psychology, 30*(1), 17.

Kinder, F. D., & Allen, L. R. (2014). Parents' perception of satisfaction with care from pediatric nurse practitioners instrument. *Journal of Pediatric Health Care, 28*(2), 128–135.

Koo, T. K., & Li, M. Y. (2016). A guideline of selecting and reporting Intraclass correlation coefficients for reliability research. *Journal of Chiropractic Medicine, 15*(2), 155–163. https://doi.org/10.1016/j.jcm.2016.02.012.

Latour, J. M., Duivenvoorden, H. J., Hazelzet, J. A., & van Goudoever, J. B. (2012). Development and validation of a neonatal intensive care parent satisfaction instrument. *Pediatric Critical Care Medicine, 13*(5), 554–559.

Latour, J. M., van Goudoever, J. B., Duivenvoorden, H. J., Albers, M. J., van Dam, N. A., Dullaart, E., & Hazelzet, J. A. (2011). Construction and psychometric testing of the