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Original Article

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Abstract

Objectives. Accurately assessing the self-efficacy levels of palliative care professionals' is crucial, as low levels of self-efficacy may contribute to the suboptimal provision of palliative care. However, there is currently lacking a reliable and valid instrument for evaluating the self-efficacy of palliative care practitioners in China. Therefore, this study aimed to translate, adapt, and validate the Palliative Care Self-Efficacy Scale (PCSS) among Chinese palliative care professionals.

Methods. This study involved the translation and cross-cultural adaptation of the PCSS, and the evaluation of its psychometric properties through testing for homogeneity, content validity, construct validity, known-groups validity, and reliability.

Results. A total of 493 palliative care professionals participated in this study. The results showed the critical ratio value of each item was >3 ($p < 0.01$), and the corrected item-total correlation coefficients of all items ranged from 0.733 to 0.818, indicating a good homogeneity of the items with the scale. Additionally, the scale was shown to have good validity, with item-level content validity index ranged from 0.857 to 1.000, and scale-level content validity index/Ave was 0.956. The exploratory factor analysis and confirmatory factor analysis (CFA) confirmed the 2-factor structure of the Chinese version of PCSS (C-PCSS), explaining 74.19% of the variance. CFA verified that the 2-factor model had a satisfactory model fit, with $\chi^2/df = 2.724$, RMSEA = 0.084, GFI = 0.916, CFI = 0.967, and TLI = 0.952. The known-groups validity of C-PCSS was demonstrated good with its sensitive in differentiating levels of self-efficacy between professionals with less than 1 year of palliative care experience ($p < 0.001$) or without palliative care training ($p = 0.014$) and their counterparts. Furthermore, the C-PCSS also exhibited an excellent internal consistency, with the Cronbach's α for the total scale of 0.943.

Significance of results. The findings from this study affirmed good validity and reliability of the C-PCSS. It can be emerged as a valuable and reliable instrument for assessing the self-efficacy levels of palliative care professionals in China.

Introduction

As an essential component of health care, palliative care aims to improve the quality of life for patients facing life-limiting illnesses. It encompasses a wide range of supportive interventions that address physical, psychological, social, and spiritual needs (Radbruch et al. 2020). With the increasing aging population and the rise in noncommunicable diseases, there is a rapidly growing global demand for palliative care services (World Health Organization 2021). In China, the aging population is growing at an unprecedented rate. The number of individuals aged 65 and above has reached 200 million by the end of 2021 in China, accounting for 14.2% of the total Chinese population (National Health Commission of the People's Republic of China 2022). It is estimated that the number of people in this age group will reach 400 million in 2050 (Yang et al. 2021), further driving the demand for palliative care.

However, the development of palliative care is still at the infant stage in China. The Chinese government initiated the promotion of palliative care in 2017, and the third batch has been launched, including 185 pilot cities in 2023. Additionally, palliative care education is currently not systematically integrated into medical education, and there is a scarcity of on-the-job training programs for palliative care professionals. Furthermore, the majority of palliative care professionals do not receive or only receive fragmented palliative care training as part of their clinical training programs (Lu et al. 2018; Zheng et al. 2021). According to the 2021 Quality of Death Index, China ranked 53rd out of 81 countries, lagging far behind other countries, reflecting the poor quality of palliative care and limited availability (Finkelstein et al. 2022).

Self-efficacy refers to an individual's confidence in their ability to perform the activities required to achieve a desired goal (Bandura 1977). People with high self-efficacy

are more likely to handle challenges, successfully accomplish tasks, and demonstrate greater proficiency in regulating their emotions and cognition (Almeida *et al.* 2013; Chan 2021). The self-efficacy of palliative care providers in delivering care significantly influences the quality of care and patient satisfaction (Carey *et al.* 2019). Therefore, to ensure the quality of palliative care and enhance better patient experiences, particularly in the early stage of palliative care within the Chinese context, it is important to gain a deep understanding of the levels of self-efficacy among palliative care providers (Carey *et al.* 2019; Salins *et al.* 2020). However, the palliative care self-efficacy tools are limited to nurses, and there is a lack of a reliable and valid Chinese version of self-efficacy tool for other health-care professionals involved in palliative care (Chen *et al.* 2012; Hu 2018).

The Palliative Care Self-Efficacy Scale (PCSS), developed by Eagar in 2003 (Eagar *et al.* 2003) and validated by Phillips in 2011 (Phillips *et al.* 2011), is a widely used tool for comprehensively assessing self-efficacy in palliative care, applicable not only to nurses, but also to doctors. It has demonstrated good reliability and validity, with the item-level content validity index (I-CVI) ranging from 0.88 to 1.00, and the Cronbach's α for the scale and subscales ranging from 0.87 to 0.92 (Phillips *et al.* 2011). Additionally, the PCSS has been translated, culturally adapted into multiple languages, including Arabic (Wazqar 2023), Swedish (Andersson *et al.* 2022), Mongolian (Kim *et al.* 2020), and Persian (Dehghani *et al.* 2020). All these versions of the PCSS had been validated and demonstrated good reliability and validity. The PCSS includes 2 theoretically distinct subscales with a total of 12 items. Subscale 1 focuses on "Perceived capability to answer end-of-life care concerns" (6 items), and subscale 2 related to "Perceived capability to respond to patient's end-of-life symptoms" (6 items). Respondents rate all the items on a 4-point Likert scale, with "4" indicating "confident of performing independently," "3" indicating "confident of performing with minimal consultation," "2" indicating "confident of performing with close supervision/coaching," and "1" indicating "need further basic instruction." The total score ranges from 12 to 48, with higher scores suggesting higher levels of palliative care self-efficacy.

To accurately evaluate the self-efficacy levels of palliative care providers in China, and establish baseline data for comparing these levels with those of palliative care professionals in other countries, therefore, the study aimed to translate, adapt, and validate the PCSS among Chinese palliative care professionals.

Methods

This methodological study consisted of 2 phases: (1) the translation and cross-cultural adaptation of the PCSS and (2) the evaluation of the psychometric properties of the Chinese version of PCSS (C-PCSS).

Phase 1: Translation and cross-cultural adaptation of the PCSS

After obtaining permission from the PCSS developer, we acquired the English version of the PCSS and proceeded to translated and culturally adapted it into Chinese, adhering to the corresponding guidelines (Brislin 1970; Sperber 2004). The detailed steps were as follows.

Step 1: Forward translation

The PCSS was independently translated into 2 versions (PCSS-1 and PCSS-2) by 2 nursing doctors who are native Chinese speakers and proficient in English.

Step 2: Reconciliation

Reconciliation was conducted through extensive discussions among the aforementioned 2 translators and an additional independent translator who had not participated in the initial translation process. A combined translation version was formed through this process (PCSS-3).

Step 3: Back translation

The back translation of the PCSS-3 was conducted by 2 bilingual translators who have completed at least 1 year of study in a native English-speaking country. Both of them had no prior involvement with the PCSS. After thorough discussions, the back-translated version was submitted to the scale developers for review, and the Chinese version of PCSS-4 was formed for expert review by combining the comments of the original developers.

Step 4: Cross-cultural adaptation and content validity

To enhance the clarity and readability of each item and assess the content validity of the C-PCSS, a modified Delphi consultation was conducted. This process comprised a single round of expert consultation followed by consensus discussions within the research group. A total of 21 experts (see Supplementary Table S1 for demographic characteristics), consisting of 15 palliative care professionals and 6 researchers with extensive experience in measures development, were invited to complete the online questionnaire. The questionnaire was distributed and collected via email or WeChat by researchers and consisted of 3 parts: (1) the brief introduction of the research program; (2) expert consultation form: experts were requested to rate the importance of each item in relation to palliative care self-efficacy on a Likert 5-point scale, score 1 indicates "not important," and 5 "very important." Additionally, an extra column was included for individual item comments or revisions; (3) the expert background information form: the demographic information of the experts, the judgment basis (practical experience, theoretical analysis, references, personal intuition), and their familiarity with items.

Phase 2: Evaluation of the psychometric properties of the C-PCSS

Participants and sample size

We employed a convenience sampling method to recruited participants from 11 March 2023 to 28 March 2023 across 32 medical institutions with palliative care centers in China. The inclusion criteria for participants were as follows: (1) age over 18 years and (2) current employment as health-care providers in palliative care centers. Participants who refused to participate in this study were excluded.

We utilized the Kendall sample estimation method to determine the sample size, following the recommendation of 5–10 times larger than the number of items in the scale (Wang 2009). For the exploratory factor analysis (EFA) of the C-PCSS, given its 12 items and assuming a 20% rate of invalid responses, the estimated sample size ranged from 72 to 144 (Cheng *et al.* 2023; Lai *et al.* 2022). To perform the confirmatory factor analysis (CFA) for the C-PCSS, recognizing that the data from EFA cannot be reused, we followed

Table 1. Demographic characteristics of the participants ($n = 493$)

Demographic characteristics	<i>n</i>	%
Gender		
Male	33	6.7
Female	460	93.3
Age		
18–30	49	9.9
31–40	223	45.2
41–50	166	33.7
≥51	55	11.1
Education level		
College degree and below	18	3.7
Bachelor degree and above	475	96.3
Professionals		
Doctors	44	8.9
Nurses	419	85.0
Administrators (nurse manager/doctor director)	30	6.1
Hospital level		
Tertiary hospitals	388	78.7
Secondary hospitals	73	14.8
Primary hospitals	32	6.5
Palliative care work experience (years)		
≤1	131	26.6
2–5	282	57.2
6–10	56	11.4
≥11	24	4.9
Palliative care training experience		
Yes	434	88.0
No	59	12.0

the principle that the sample size for CFA should be no less than 200 and be greater than that of EFA (Barbara and Fidell 2021; Keenan and James 2015). Therefore, a minimal of 272 participants were required in this study.

Data collection

We adopted an online data collection method by sending the website link or QR code of the electronic questionnaire to the potentially eligible participants. The electronic questionnaire includes 3 pages. On the first page of this survey, participants were directed to read the contents of the participant informed consent form, which included detailed information about the purposes of this study, the time that may be spent, the possible risks and benefits associated with participation, as well as avenues for raising complaints about this study. The second page is to fill in the demographic information of the participants including gender, age, marital status, educational background, hospital level, professional title, years of experience in palliative care, and experience of participating in palliative care training course. The final page is to fill the Chinese version of the PCSS.

Data analysis

Data were analyzed using IBM SPSS version 26.0 and SPSS AMOS version 26.0. The categorical data were described by calculating frequencies and percentages, the continuous data were described as the mean and standard deviation (SD). We assessed the item analysis, content validity, construct validity, known-groups validity, and reliability of C-PCSS using the following methods.

Item analysis

(1) Critical ratio (CR) method: the total score of C-PCSS was sorted from low to high, and those with scores in the top 27% were used as the low group and those in the bottom 27% were used as the high group. We conducted an independent sample *t*-test and considered a CR value was >3 and $p < 0.05$ as indicative of high discriminant validity (Kelley 1939). Entries that did not reach significance ($p > 0.05$) were removed. (2) Correlative coefficient method: the correlation of each item with the total score of the scale was analyzed. A higher correlation between the items and the total score indicated better homogeneity of the items with the scale, and items with low homogeneity (correlation coefficient <0.4) with the scale were removed (Tang et al. 2022).

Validity

Content validity. The content validity index (CVI) was calculated at both the item level (I-CVI) and scale level (S-CVI). The I-CVI was derived from the proportion of experts who rated the item as 4 (important) or 5 (very important) on a Likert 5-point scale. The S-CVI was presented as the average value of I-CVIs. Adequate content validity was determined if I-CVI ≥ 0.78 and S-CVI ≥ 0.90 (Zhang and Zhou 2020).

Construct validity. The EFA and CFA were used to analysis the construct validity (Heo et al. 2022). Valid data were inputted into the computer which randomly divided the data in half. One half was used for EFA and the other for CFA.

EFA was conducted using principal component analysis with varimax rotation to establish the factor structure. Kaiser–Meyer–Olkin's (KMO) measure and Bartlett's sphericity were verified before the EFA; a KMO value >0.5 and significant Bartlett's test $p < 0.05$ indicated that is suitable for factor analysis. The items with factor loadings <0.4 will be considered to remove (Zhang and Zhou 2020).

CFA was performed by importing data into AMOS version 26.0 to establish a preliminary model and then fitting the model to further test the structure of C-PCSS. The following indices were used to evaluate the model fit: Chi-square freedom ratio (χ^2/df) < 3.00 , root-mean-square error of approximation (RMSEA) < 0.08 , goodness-of-fit index (GFI) > 0.90 , comparative fit index (CFI) > 0.90 , Tucker–Lewis index (TLI) > 0.90 (Hooper et al. 2008).

Known-groups validity. We hypothesized that professionals with less than 1 year of palliative care experience, or without palliative care training would exhibit lower self-efficacy levels than their counterparts. To test the C-PCSS is sensitive to differentiate the levels of self-efficacy among different groups of professionals, known-groups validity was assessed by comparing mean scores on the total scale and subscales between participants with over 1 year of palliative care experience and those with 1 year or less, as well as between participants who received palliative care training and those who did not. We used the Mann–Whitney *U* test in a nonparametric

Table 2. Item analysis, factor loadings, and internal consistency reliability of the C-PCSS

Items	CR value	r value	Factor1	Factor2	Cronbach's α
Subscale 1: Perceived capability to answer end-of-life care concerns					
1. Answering patients questions about the dying process	26.564	0.749**	0.843	0.191	0.904
2. Supporting the patient or family member when they become upset	26.278	0.782**	0.820	0.314	
3. Informing people of the support services available	24.134	0.793**	0.771	0.346	
4. Discussing different environmental options (e.g. hospital, home, accompaniment of family members)	24.753	0.778**	0.809	0.288	
5. Discussing patient's wishes for after their death	23.672	0.733**	0.739	0.313	
6. Answering queries about the effects of certain medications	22.926	0.775**	0.745	0.355	
Subscale 2: Perceived capability to respond to patient's end-of-life symptoms					
7. Assessing and managing of pain from the patient	21.506	0.768**	0.184	0.864	0.933
8. Assessing and managing of terminal delirium	30.627	0.806**	0.305	0.810	
9. Assessing and managing of terminal dyspnea (breathlessness)	32.063	0.815**	0.352	0.816	
10. Assessing and managing of nausea/vomiting	29.308	0.818**	0.295	0.865	
11. Assessing and managing of constipation	25.025	0.816**	0.348	0.840	
12. Helping and supporting for patients with limited decision-making capacity	27.241	0.794**	0.558	0.564	
Total scale					0.943

Factor 1: Perceived capability to answer patient's end-of-life care concerns; Factor 2: Perceived capability to respond to patient's end-of-life symptoms.

** $p < 0.001$.

test to analyze the known-groups validity. The result was considered statistically significant when the 2-tailed p -value was less than 0.05.

Reliability

Reliability was evaluated by internal consistency reliability and split-half reliability. Internal consistency reliability was evaluated by calculating Cronbach's α coefficients for each dimension and the total scale. Cronbach's α coefficient 0.70 was considered an acceptable internal consistency level (Cronbach 1951). The split-half reliability was assessed by calculating the correlation coefficient between the total scores of the first 6 items and the final 6 items of the C-PCSS.

Ethical statement

The study was approved by the Human Research Ethics Committee of Hunan Cancer Hospital (No. 2022-41). This study was conducted according to the principles of the Declaration of Helsinki and followed relevant guidelines and regulations. Informed consent was obtained from all participants prior to their participation in the survey.

Results

Phase 1: Translation and cross-cultural adaptation

In the translation phase, only minor grammatical and wording discrepancies were identified in the forward translations of the PCSS, and these were easily resolved through discussion by the 2 translators. In the cross-cultural adaptation section, to enhance clarity

and comprehension in the Chinese context, for items 7–11, the phrase “Reacting to and coping with” was changed to “Assessing and managing.” Additionally, some experts suggested that the statement in item 12 needed to be adjusted. Therefore, for item 12, “Reacting to and coping with limited patient decision-making capacity” was revised to “Helping and supporting for patients with limited decision-making capacity” (see Supplementary Table S2 for C-PCSS). All the modifications were reviewed and confirmed with the developer.

Phase 2: Psychometric evaluation of C-PCSS

Demographic characteristics

In total, 493 valid questionnaires were included in our analyses. No missing data was observed in our study due to each item in our electronic questionnaire was required to be completed. The collected data were from 419 nurses, 44 doctors, and 30 administrators (nurse manager, doctor director). More details are presented in Table 1.

Item analysis

The results showed the CR value of each item was >3 ($p < 0.01$), r value of each item was >0.4 , which indicated that there was a good homogeneity of the items with the scale (Table 2).

Validity

Content validity. The expert response rate was 100%, I-CVI ranged from 0.857 to 1.000, and S-CVI/Ave was 0.956.

Table 3. The goodness-of-fit indices of the C-PCSS

	χ^2/df	RMSEA	GFI	CFI	TLI
Acceptable fit values	<3.00	≤0.08	>0.90	>0.90	>0.90
C-PCSS	2.724	0.084	0.916	0.967	0.952

χ^2/df = Chi-square freedom ratio; RMSEA = root-mean-square error of approximation; GFI = goodness-of-fit index; CFI = comparative fit index; TLI = Tucker-Lewis index; C-PCSS = Chinese version of palliative care self-efficacy scale.

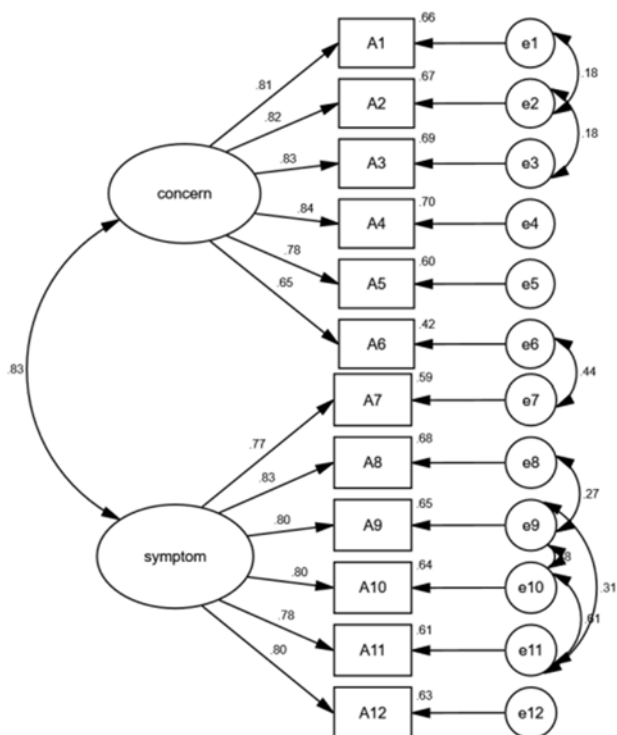


Figure 1. Confirmatory factor analysis of the C-PCSS.

Construct validity. The 493 questionnaires were randomly grouped into EFA (247 cases) and CFA (246 cases) groups using Excel (Microsoft, 2021) to explore the construct validity of the scale. EFA results showed that the KMO value of the C-PCSS was 0.909, Bartlett’s test was $\chi^2 = 2581.780, p < 0.001$, indicating the fitness for EFA. The principal component analysis with varimax rotation extracted 2 common factors, which were the same as the original PCSS. These were “Perceived capability to answer patient’s end-of-life care concerns” and “Perceived capability to respond to patient’s end-of-life symptoms.” The cumulative variance contribution rate was 74.19%, which met the requirement that the cumulative variance contribution rate should be at least 40%. Details of factor loadings are presented in Table 2. CFA verified that the 2-factor model had a satisfactory model fit with $\chi^2/df = 2.724, RMSEA = 0.084, GFI = 0.916, CFI = 0.967,$ and $TLI = 0.952$. Detailed results are shown in Table 3 and Figure 1.

Known-groups validity. The results supported our hypothesis that professionals with less than 1 year of palliative care experience or without palliative care training exhibited lower self-efficacy levels than their counterparts. Participants with more than 1 year of palliative care experience scored higher on total C-PCSS score ($M = 38.57, SD = 0.45$) compared to those with 1 year or less

experience ($M = 34.80, SD = 0.78$) ($p < 0.001$). Similarly, they also scored higher on subscale 1 and subscale 2 (Table 4). A significant difference was observed between participants who underwent palliative care training and those who did not. Those who participated the training ($M = 37.88, SD = 0.41$) had higher total C-PCSS scores than those who did not undertake any courses ($M = 34.49, SD = 1.31$) ($p = 0.014$). Additionally, they also scored higher on subscale 1 and subscale 2 (Table 4).

Reliability

Internal consistency reliability for the whole scale was 0.943, indicating high internal consistency or homogeneity for the scale. The Cronbach’s α coefficients for each subscale of the C-PCSS ranged from 0.904 to 0.933. Split-half reliability for the whole scale was 0.844.

Discussion

This study cross-culturally adapted and validated the PCSS within the Chinese context, it is a widely utilized measurement tool due to its reliability, validity, the advantage of being fast and simple to complete, and without professional-specific limitations (Andersson et al. 2022; Dehghani et al. 2020; Kim et al. 2020). The forward and backward translation processes were performed rigorously, adhering to established guidelines and recommendations (Brislin 1970; Sperber 2004). And the cultural adaptation procedure ensures that each individual item is clarify, readable in Chinese, and is equivalence to the original English version. Thus, we believe that the C-PCSS can be used by Chinese palliative care professionals without major difficulty.

In this study, all the item-total correlation coefficients were above 0.4, which indicated a high degree of item homogeneity within the scale. The internal consistency results for the C-PCSS exhibited an excellent level (raw coefficient alpha: 0.943), significantly surpassing the threshold of 0.70 recommended by Nunnally and aligning closely with the original version (raw coefficient alpha: 0.92) (Nunnally 1978; Phillips et al. 2011). The subscale 1 “Perceived capability to answer patient’s end-of-life care concerns,” and the subscale 2 “Perceived capability to respond to patient’s end-of-life symptoms” also showed an excellent internal consistency, with the Cronbach’s α of 0.904 and 0.933 respectively, The split-half reliability of the whole scale was 0.844, reinforcing the robustness of the C-PCSS as a reliable tool for assessing self-efficacy in palliative care.

In terms of the content validity, the majority of the experts in this study unanimously thought that each item in the PCSS could adequately reflect the purpose of the measurement. The findings from the I-CVI and S-CVI analysis established the excellent content validity of the C-PCSS. Meanwhile, the construct validity of the C-PCSS has been well supported by the results of the EFA and CFA in this study. The results of both EFA and CFA confirmed the 2-factor structure of this instrument, explaining 74.19% of the variance. In the original English version, the results of EFA also revealed the present 2 factors, accounting for a cumulative total variance of 65.3% (Phillips et al. 2011). In addition, CFA verified that the 2-factor structure of the C-PCSS had a satisfactory model fit, and all the factor loadings in each domain were above 0.4, which further confirmed the stability of the 2-factor structure.

The findings of the known-groups comparison indicated that the C-PCSS exhibited good known-groups validity, showing sensitivity in differentiating levels of self-efficacy between

Table 4. Known-groups validity of the C-PCSS

Variables	Group	n (%)	C-PCSS		Subscale 1		Subscale 2	
			M (SD)	p	M (SD)	p	M (SD)	p
Palliative care work experience (years)	≤1	131 (26.57)	34.80 (0.78)	<0.001**	16.69 (0.40)	<0.001**	18.12 (0.43)	0.006**
	>1	362 (73.43)	38.57 (0.45)		19.14 (0.25)		19.43 (0.24)	
Palliative care training experience	Yes	434 (88.03)	37.99 (0.41)	0.014*	18.68 (0.23)	0.043*	19.31 (0.22)	0.008**
	No	59 (11.97)	34.49 (1.31)		17.07 (0.70)		17.42 (0.68)	

Subscale 1: Perceived capability to answer end-of-life care concerns.

Subscale 2: Perceived capability to respond to patient's end-of-life symptoms.

** $p < 0.01$; * $p < 0.05$.

professional with less than 1 year of palliative care experience and their counterparts ($p < 0.001$).

Health-care professionals with over 1 year of palliative care experience scored significantly higher on the C-PCSS in comparison to their counterparts who had less than or equal to 1 year of experience, as well as they reported higher scores on both subscale 1 and subscale 2 of the C-PCSS. This noteworthy difference highlights the positive impact of long-term engagement in palliative care services on professionals' self-efficacy. The findings were supported by studies conducted by Peng and Van (Peng et al. 2019; Van Dyk et al. 2016), health-care professionals with more years of experience have more contact with end-of-life patients, and can effectively perform palliative care clinical work and cope with emergencies, and exhibit lower levels of fear regarding mortality compared to their less experienced counterparts (Peng et al. 2019; Van Dyk et al. 2016). These factors collectively play a substantial role in elevating their self-efficacy when caring for patients. Additionally, the study demonstrated a marked and statistically significant difference between participants who had completed palliative care training courses and those who had not, consistent with the findings of Phillips et al. (2011). In our study, those who had taken part in palliative care training courses achieved higher total scores on the C-PCSS in comparison to their counterparts who had not undergone training, which further identified that the palliative care education and training programs contribute significantly to the development and improvement of self-efficacy in the realm of palliative care (Li et al. 2021). Health-care educational administrators can develop culturally appropriate palliative care curriculum training programs in the future to improve practitioners' perceived competence in palliative care symptom management and in solving patient-related concerns.

Limitations

This study makes a valuable contribution to the development of palliative care in China. However, it is important to acknowledge some limitations that should be considered in our study. First, there is a professional disproportion in the phase of evaluating the psychometric properties for the PCSS, with the majority of participants being nurses, this may cause bias into the study results. Second, the criterion-related validity of the C-PCSS was not assessed in our study due to the unavailability of suitable criterion tools. Future research should address this aspect to confirm the instrument's applicability in China. Finally, this study primarily focused on content validity, structure validity, and known-groups validity, the face validity assessment was not conducted in our study. It is advisable for future researchers to incorporate an

appraisal of face validity to further ensure the clarity, relevance, and appropriateness of the C-PCSS.

Conclusions

The findings from this study affirmed the good validity and excellent reliability of the C-PCSS. The scale's strong internal consistency, content and construct validity, and known-groups validity collectively demonstrated its utility in assessing the self-efficacy of Chinese palliative care professionals. Therefore, the C-PCSS can be emerged as a valuable and reliable instrument for quantifying palliative care professionals' self-efficacy levels in China. Considering the professional disproportion among the participants in this study, future studies need to further validate the C-PCSS in a more diverse range of medical personnel cohorts with larger sample sizes.

Supplementary material. The supplementary material for this article can be found at <https://doi.org/10.1017/S1478951524000518>.

Data availability statement. The data used during this study are available from the corresponding authors on reasonable request.

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Competing interests. The authors declare no conflict of interest.

Ethical approval. The study was approved by the Human Research Ethics Committee of Hunan Cancer Hospital (No. 2022-41). This study was conducted according to the principles of the Declaration of Helsinki and followed relevant guidelines and regulations. Informed consent was obtained from all participants before they participated in this survey.

References

- Almeida RMM, Flores ACS and Scheffer M (2013) Suicidal ideation, problem solving, expression of anger and impulsiveness in dependents on psychoactive substances. *Psicologia Reflexão e Crítica* 26(1), 1–9. doi:10.1590/S0102-79722013000100001

- Andersson S, Granat L, Brännström M, et al.** (2022) Translation, cultural adaptation, and content validation of the Palliative Care Self-Efficacy Scale for use in the Swedish context. *International Journal of Environmental Research & Public Health* **19**(3), 1143. doi:10.3390/ijerph19031143
- Bandura A** (1977) Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review* **84**(2), 191–215. doi:10.1037//0033-295x.84.2.191
- Barbara GT and Fidell LS** (2021) *Using Multivariate Statistics*, 7th edn. Upper Saddle River, NJ: Pearson.
- Brislin RW** (1970) Back-translation for cross-cultural research. *Journal of Cross-Cultural Psychology* **1**, 185–216. doi:10.1177/135910457000100301
- Carey ML, Zucca AC, Freund MA, et al.** (2019) Systematic review of barriers and enablers to the delivery of palliative care by primary care practitioners. *Palliative Medicine* **33**(9), 1131–1145. doi:10.1177/0269216319865414
- Chan SW** (2021) Chronic disease management, self-efficacy and quality of life. *Journal of Nursing Research* **29**(1), e129. doi:10.1097/JNR.0000000000000422
- Chen X, Chen J and Bai Q** (2012) Self-efficacy for palliative care in nurses and influencing factors. *Modern Clinical Nursing* **11**(02), 11–13. doi:10.3969/j.issn.1671-8283.2012.02.004
- Cheng N, Zhao Y, Li X, et al.** (2023) Chinese version of the service user technology acceptability questionnaire. *Asia-Pacific Journal of Oncology Nursing* **10**(6), 100239. doi:10.1016/j.apjon.2023.100239
- Cronbach LJ** (1951) Coefficient alpha and the internal structure of tests. *Psychometrika* **16**, 297–334. doi:10.1007/BF02310555
- Dehghani F, Barkhordari-Sharifabad M, Sedaghati-Kasbakh M, et al.** (2020) Effect of palliative care training on perceived self-efficacy of the nurses. *BMC Palliative Care* **19**(1), 63. doi:10.1186/s12904-020-00567-4
- Eagar K, Senior K, Fildes D, et al.** (2003) The Rural Palliative Care Evaluation Tool Kit: A compendium of tools to aid in the evaluation of palliative care projects. Centre Health Services Development, University of Wollongong.
- Finkelstein EA, Bhadelia A, Goh C, et al.** (2022) Cross country comparison of expert assessments of the quality of death and dying 2021. *Journal of Pain and Symptom Management* **63**(4), e419e429. doi:10.1016/j.jpainsymman.2021.12.015
- Heo S, Kim M, You H, et al.** (2022) Reliability and validity of the Self-Efficacy in Palliative Care Scale among nurses. *Palliative and Supportive Care*, 1–7. doi:10.1017/S147895152200164X
- Hooper D, Coughlan J and Mullen MR** (2008) Structural equation modelling: Guidelines for determining model fit. *Electronic Journal of Business Research Methods* **6**(1), 141–146. doi:10.21427/D7CF7R
- Hu L** (2018) Investigation and analysis of nurses' self-efficacy and influencing factors in palliative care. *Chinese Medical Journal of Metallurgical Industry* **35**(02), 207–208. doi:10.13586/j.cnki.jyxy1984.2018.02.075
- Keenan A and James P** (2015) *Applied Multivariate Statistics for the Social Sciences*, 6th edn. New York: Routledge.
- Kelley TL** (1939) The selection of upper and lower groups for the validation of test items. *Journal of Educational Psychology* **30**(1), 17. doi:10.1037/h0057123
- Kim JS, Kim J and Gelegiamts D** (2020) Knowledge, attitude and self-efficacy towards palliative care among nurses in Mongolia: A cross-sectional descriptive study. *PLoS One* **15**(7), e0236390. doi:10.1371/journal.pone.0236390
- Lai J, Zhang R, Hong M, et al.** (2022) Development and validation of the Nurse's Workplace Mental Health Questionnaire. *International Journal of Nursing Science* **9**(4), 521–528. doi:10.1016/j.ijnss.2022.09.004
- Li S, Liu X, Xu X, et al.** (2021) Research progress on factors affecting nurses' self-efficacy in hospice care and correspondent coping strategies. *Chinese Nursing Management* **21**(02), 280–284. doi:10.3969/j.issn.1672-1756.2021.02.024
- Lu Y, Gu Y and Yu W** (2018) Hospice and palliative care in China: Development and challenges. *Asia-Pacific Journal of Oncology Nursing* **5**(1), 2632. doi:10.4103/apjon.apjon_72_17
- National Health Commission of the People's Republic of China** (2022) Communique on the development of the national cause for aging in 2021. https://www.gov.cn/fuwu/2022-10/26/content_5721786.htm (accessed August 2023).
- Nunnally JC** (1978) *Psychometric Theory*, 2nd edn. Nueva York, NY: McGraw-Hill.
- Peng J, Chen Y, Liu X, et al.** (2019) The current status and influencing factors of nurses' hospice care self-efficacy. *Chinese Nursing Management* **19**(09), 1306–1310. doi:10.3969/j.issn.1672-1756.2019.09.006
- Phillips J, Salamonson Y and Davidson PM** (2011) An instrument to assess nurses' and care assistants' self-efficacy to provide a palliative approach to older people in residential aged care: A validation study. *International Journal of Nursing Studies* **48**(9), 1096–1100. doi:10.1016/j.ijnurstu.2011.02.015
- Radbruch L, De Lima L, Knaut F, et al.** (2020) Redefining palliative care—A new consensus-based definition. *Journal of Pain and Symptom Management* **60**(4), 754–764. doi:10.1016/j.jpainsymman.2020.04.027
- Salins N, Ghoshal A, Hughes S, et al.** (2020) How views of oncologists and haematologists impacts palliative care referral: A systematic review. *BMC Palliative Care* **19**(1), 175. doi:10.1186/s12904-020-00671-5
- Sperber AD** (2004) Translation and validation of study instruments for cross-cultural research. *Gastroenterology* **126**, 1241–28. doi:10.1053/j.gastro.2003.10.016
- Tang B, Lu Q, Wu Y, et al.** (2022) The Chinese version of the Quality of Life in Childhood Epilepsy Questionnaire-16-C (QOLCE-16-C): Translation, validity, and reliability. *Health and Quality of Life Outcomes* **20**(1), 52. doi:10.1186/s12955-022-01960-8
- Van Dyk J, Siedlecki SL and Fitzpatrick JJ** (2016) Frontline nurse managers' confidence and self-efficacy. *Journal of Nursing Management* **24**(4), 533–539. doi:10.1111/jonm.1235
- Wang J** (2009) *Clinical Epidemiology-Design, Measurement and Evaluation of Clinical Study*. Shanghai: Science and Technology Publishing House.
- Wazqar DY** (2023) Arabic version of the Palliative Care Self-Efficacy Scale: Translation, adaptation, and validation. *Palliative and Supportive Care* **21**(5), 863–870. doi:10.1017/S1478951522001456
- World Health Organization** (2021) Quality health services and palliative care: Practical approaches and resources to support policy, strategy and practice. <https://www.who.int/publications/i/item/9789240035164> (accessed August 2023).
- Yang W, Wu B, Tan SY, et al.** (2021) Understanding health and social challenges for aging and long-term care in China. *Research on Aging* **43**(34), 1271–35. doi:10.1177/0164027520938764
- Zhang C and Zhou Y** (2020) Analysis on errors regarding content validity index used in evaluation of measurement tools in Chinese nursing literature. *Journal of Nursing Science* **35**, 86–88. doi:10.3870/j.issn.1001-4152.2020.04.086
- Zheng R, Guo Q, Chen Z, et al.** (2021) An exploration of the challenges for oncology nurses in providing hospice care in mainland China: A qualitative study. *Asia-Pacific Journal of Oncology Nursing* **8**(2), 139–146. doi:10.4103/apjon.apjon_62_20