British Journal of Hospital Medicine

Br. J. Hosp. Med. (Lond) **2026**; 87(1): 50391
https://doi.org/10.31083/BJHM50391

Article

A Mixed-Methods Study on the Current Situation and Factors Influencing Nurses' Practice of Palliative Care in Hangzhou, China

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Academic Editor: John Alcolado
Submitted: 17 July 2025 Revised: 3 November 2025 Accepted: 7 November 2025 Published: 26 January 2026

Abstract

Aims/Background: With the growing need for high-quality end-of-life care in China, this study aimed to evaluate the practical palliative care skills of nurses across 17 pilot institutions in Hangzhou, identify the key factors influencing these skills, and explore their interrelationships. The ultimate goal was to inform the development of a targeted training and assessment system that can support and enhance palliative care team development in China. **Methods**: This study used a convergent mixed-methods design integrating quantitative and qualitative approaches. From February to May 2022, 723 nurses from 17 palliative care pilot institutions in Hangzhou, China, were surveyed using structured scales assessing their palliative care knowledge, perceived difficulty, and self-reported practice. Descriptive, univariate, and multivariate analyses were performed. Semi-structured interviews were subsequently conducted with eight nurses to gain deeper insights into their practical experiences and challenges. **Results**: Quantitative findings indicated that palliative care practice competency was at an upper-intermediate level (64.17 $\pm$ 15.99). Multivariate linear regression identified gender, age, and willingness to volunteer in palliative care as significantly affecting nurses' palliative care practice ability. Qualitative analysis demonstrated three core themes: (1) cognitive understanding present but specialized knowledge lacking; (2) behavioral gaps in technical skills and symptom management; and (3) structural barriers, including absence of guidelines and restrictive policies. Integrated results highlighted that personal willingness, cognitive awareness, social support, and training opportunities were consistent determinants of competency. **Conclusion**: Nurses in Hangzhou demonstrate moderate levels of palliative care competency; however, notable gaps impede high-quality service delivery. There is an urgent need for systematic training, particularly in symptom management and communication skills. Multilevel efforts involving government, healthcare institutions, and the wider community are essential. Priorities include optimizing resource allocation, refining insurance policies, establishing specialized training systems, and enhancing public education to foster informed and rational understanding of end-of-life care.

Keywords: frail elderly; nurses; palliative care; attitude to death

1. Introduction

Palliative care (PC) involves comprehensive support provided by a multidisciplinary team at various levels of the healthcare and social system for patients with terminal illnesses and older individuals with advanced chronic conditions. It implements a holistic approach that includes physical, psychological, spiritual, and social dimensions of care. In China, the adoption of PC began relatively late compared with high-income countries in Australia and Japan [1], where such programs were established earlier and have now developed into mature models. These countries have established well-structured multidisciplinary team models, trained a sufficient number of specialized professionals, and legislated comparatively comprehensive legal and medical insurance frameworks. Furthermore, they have implemented mechanisms such as advance directives and medical proxy arrangements to ensure the stable and sustainable delivery of palliative services.

According to Beijing Youth Daily, palliative care coverage in China remains extremely low, with only an estimated 0.3% of those who need such services receiving them [2]. A cross-country international comparison further highlights this gap. China ranked 71st of 80 in the Economist Intelligence Unit (EIU)'s 2015 Quality of Death Index [3] and 53rd of 81 countries in a 2021 expert-based assessment [4]. Compared with World Health Organization standards, China's overall capacity to deliver PC lags significantly behind that of many other countries, and its PC system remains at an initial developmental stage [5]. Given the key role of nurses in PC delivery, their professional competence and the quality of nursing care are crucial to improving the quality of life of terminally ill patients. In light of the significant unmet demand for PC in China, enhancing national capacity to provide high-quality palliative services is imperative.

Currently, there are 15 PC pilot units and two PC guidance centers in Hangzhou, China. Each PC pilot unit has been delivering services for more than two years; however, the overall establishment of PC in the region remains in the early, exploratory stages. Developing professional PC nursing teams is fundamental to improving China's capac-

ity in this domain. However, the competency requirements for nurses are significantly high. Nursing competence in PC involves observable clinical performance and behavior, which is affected by multiple factors. Moreover, based on social cognitive theory, competence is a generative capability manifested in practical behaviors, integrating knowledge, skills, attitudes, and professional qualities.

As key participants throughout the multidisciplinary PC framework, nurses play a central role in advancing PC in China [6]. Their practical capability to provide high-quality PC directly affects service outcomes [7], making their role increasingly crucial. At present, most nurses working at PC pilot institutions are transferred from other departments and often lack targeted, systematic professional training. Hence, their PC practice ability varies considerably, and the level of their actual clinical performance remains unknown.

Guided by Miller's pyramid model, this mixed-methods study assessed the PC competence of nurses working in Hangzhou's pilot institutions. It evaluated current competence abilities, investigated contributing factors and deficiencies, and highlighted gaps between knowledge and practice. The findings provide an empirical foundation for establishing targeted training and assessment tools and may facilitate the advancement of PC-implementing teams and service delivery in China.

2. Methods

2.1 Study Participants

From February to May 2022, nurses from PC pilot medical institutions in Hangzhou, China, were enrolled as the study population. Based on sample size estimation, 723 nurses were included in the quantitative study, and 8 participated in qualitative interviews to evaluate their current PC practice competence and to identify factors affecting it.

Inclusion criteria for the quantitative survey included: (1) employment at a PC pilot institution in Hangzhou, China; (2) at least one year of clinical work experience; and (3) possession of a valid nursing practice license. However, eligibility criteria for the qualitative survey included: (1) currently working as a dedicated PC nurse in hospitals, community settings, or institutions implementing the pilot program; (2) at least two years of palliative care experience; and (3) strong verbal communication skills and willingness to cooperate with the researchers.

2.2 Survey Framework and Protocol

This study adopted Miller's Pyramid as the theoretical model [8]. Developed by American medical educator George Miller, this model offers a structured framework for evaluating clinical competence. This model conceptualizes the progression from knowledge to practice in four hierarchical levels: "knows" (acquisition of knowledge), "knows how" (understanding how to apply knowledge), "shows how" (demonstration of skills), and "does" (performance in clinical settings).

This study adopted both quantitative and qualitative survey approaches. In the former method, previously established questionnaires, including Palliative Care Self-Reported Practices Scale (PCPS), Palliative Care Difficulties Scale (PCDS), and Palliative Care Quiz for Nursing (PCQN), were used. In the latter method, an objective sampling approach was applied, where semi-structured interviews were conducted. These approaches aimed to understand the practical performance of nurses in PC and to determine how various factors limit or support their capabilities to deliver high-quality nursing care.

2.3 Sample Size Estimation

The sample size was calculated based on the standard requirement for multifactorial analysis, which suggests including 5 to 10 participants per questionnaire. To maximize the reliability and stability of the results, an upper limit of 10 participants per time was adopted. The survey included 26 items on general information, 18 items on practice competence, and two additional scales (difficulty and knowledge), each considered as a single item, resulting in a total of 46 items. Based on this, the initial required sample size was 460. To account for potential non-response and incomplete data, a 20% increase was applied, yielding a minimum required sample size of 552. Ultimately, 723 nurses participated in the survey, exceeding the estimated sample size and meeting the predetermined sample size criterion.

2.4 Data Collection and Questionnaire Types

Data were collected using various questionnaire types as follows:

2.4.1 General Information Questionnaire

This questionnaire was designed with reference to national and international literature and collected data on: employing institution, ethnicity, gender, age, marital status, religious belief, educational level, years of work experience, professional title, monthly income, whether the participant had received any formal PC education during academic training, participation in continuing professional development courses on PC, experience in providing care for terminally ill patients, personal experience in caring for seriously ill family members at home, experience of the death of a family member or friend, interest in working in PC, willingness to transfer to a PC unit, previous participation in PC volunteer activities, and family members' attitudes toward involvement in PC work.

2.4.2 Palliative Care Self-Reported Practices Scale (PCPS)

The PCPS, developed by Nakazawa *et al.* in 2010 [9] based on extensive literature reviews and expert consultation, was adopted to examine nurses' self-reported PC practices. The Chinese version of the PCPS was used to assess nurses' performance, describe the current status of practice,

comprehensively explore influencing factors, and identify targets for improvement in PC service delivery.

2.4.3 Palliative Care Difficulties Scale (PCDS)

The PCDS, also developed by Nakazawa *et al.* [9] was used to assess the difficulties experienced by healthcare workers in providing PC. The scale primarily examines the performance of nurses in PC in terms of the pyramid theoretical behavior level, including communication within multidisciplinary teams, communication with patients and their families, availability of expert support, knowledge of symptom management, and coordination with community resources.

2.4.4 Palliative Care Quiz for Nursing (PCQN)

The PCQN, developed by Ross *et al.* [10] at the University of Ottawa School of Nursing, was used to measure nurses' knowledge of PC. The PCQN is used to assess the degree to which medical staff have mastered PC knowledge and to identify common misconceptions across different groups [10,11]. In this study, the PCQN was primarily used to examine the knowledge level of nurses. All scales were used with permission from the original authors or copyright holders.

The Chinese versions of the PCPS, PCDS, and PCQN have previously demonstrated good reliability and validity in Chinese nursing cohorts.

For the qualitative items, offline face-to-face interviews were performed and audio-recorded to ensure data integrity. Before each interview, participants were briefed on the study objectives and procedures, and written informed consent was obtained. Sampling continued until data saturation was achieved, determined by the emergence of no new information rather than by participant numbers. Saturation was assessed by topic, and interviews were discontinued when no new information emerged. In total, eight nurses participated (codes A–H) in qualitative interviews.

2.5 Questionnaire Reliability

Internal consistency of the scale was assessed using Cronbach's α for both the overall scale (PCPS) and each subdimension (End-of-Stage Care, Patient- and Family-Centered Care, Pain, Delirium, Dyspnea, and Communication). The overall Cronbach's α was 0.969, while the values for the individual dimensions were 0.886, 0.937, 0.935, 0.864, 0.893, and 0.875, respectively, indicating good internal consistency.

The Chinese versions of the PCPS, PCDS, and PCQN scales, whose psychometric properties (including reliability and validity) have been validated in previous studies [12–14], were employed in this survey. In the present sample, all instruments demonstrated satisfactory internal consistency, confirming their reliability for use in this study.

2.6 Data Analysis

Data were analyzed using SPSS 26.0 (IBM Corp., Armonk, NY, USA). Qualitative variables were presented as frequencies and percentages. Normality across data was evaluated using the Kolmogorov-Smirnov test, and homogeneity of variance was examined using the Levene test. Quantitative data that met the normality and homogeneity of variance were presented as mean $\pm$ standard deviation. Item-level, dimension, and total scores for PC practice ability, knowledge, and difficulty were calculated. Between-group comparisons were performed using independent sample *t*-tests or one-way analysis of variance (ANOVA) as appropriate.

Univariate analysis, Pearson correlation analysis, and multiple linear regression analysis were used to examine the associations among demographic variables, knowledge, difficulty, and practical ability scores. A p-value < 0.05 was considered statistically significant. For the multiple linear regression analysis, all variables with significant associations in univariate analyses ($p < 0.05$) were entered into the model using the enter method. Multicollinearity was evaluated using the Variance Inflation Factor (VIF) and Tolerance. Variables with a VIF greater than 10 or a Tolerance less than 0.1 were considered to indicate significant multicollinearity and were excluded from the model, prioritizing the removal of those with lower statistical significance.

Qualitative interview data were analyzed thematically using NVivo 12 (QSR International Pty Ltd., Doncaster, Victoria, Australia). Transcribed interviews were coded, categorized into nodes, and comparatively reviewed to identify relationships, which were then consolidated and integrated into thematic categories.

3. Results

3.1 Findings From Quantitative Survey Analysis

This study enrolled 723 nurses. The participants were predominantly female (93.91%), with the majority aged between 21–40 years (87.55%) and holding a bachelor's degree or higher (82.02%). Furthermore, most participants were employed in tertiary hospitals (58.23%). Professional titles and years of work experience varied across the cohort, with senior nurses comprising the largest subgroup (48.69%, Table 1).

3.1.1 Nurses' Knowledge of Palliative Care

Using the PC practice competency score as the dependent variable and nurses' general demographic characteristics as independent variables, univariate analyses were conducted for each demographic variable. The results revealed statistically significant differences in PC practice competency scores across different workplaces, genders, age groups, years of working experience, and professional titles ($p < 0.05$) (**Supplementary Table 1**). In contrast, no

Table 1. Baseline characteristics of study participants (n = 723).

Item	Category	Case number (n)	Constituent ratio (%)
Workplace	Tertiary hospital	421	58.23
	Secondary hospital	194	26.83
	Community health center	61	8.44
	Medical institutions	47	6.50
Gender	Male	44	6.09
	Female	679	93.91
Age (years old)	21–30	343	47.44
	31–40	290	40.11
	≥41	90	12.45
Religious belief	None	706	97.65
	Have	17	2.35
Education level	Secondary school	2	0.28
	Junior college	128	17.70
	Undergraduate	588	81.33
	Postgraduate and above	5	0.69
Years of working experience	<5	233	32.23
	6–10	227	31.40
	11–15	126	17.43
	≥16	137	18.95
Professional title	Nurse	136	18.81
	Senior nurse	352	48.69
	Supervisor nurse	185	25.59
	Co-chief nurse	39	5.39
	Chief nurse	11	1.52
Ethnicity	Han Chinese	705	97.51
	Ethnic Minorities	18	2.49
Marital status	Married	476	65.84
	Unmarried	237	32.78
	Other	10	1.38
Monthly income (CNY)	<2500	2	0.28
	2501–5000	102	14.11
	5001–7500	271	37.48
	7501–10,000	295	40.80
	>10,000	53	7.33

1 CNY ≈ 0.128 EUR.

significant differences were found in ethnicity, marital status, religious belief, educational level, or income status ($p > 0.05$).

Similarly, significant associations with PC practice competency scores were identified for the following survey items ($p < 0.05$): (1) recipient of on-the-job PC training (including participation in PC courses within or outside the hospital); (2) prior experience of caring for terminally ill patients; (3) interest in PC work; (4) willingness to participate in PC-related volunteer activities; and (5) family members' attitude toward nurse's engagement in PC. The mean score of the PC knowledge questionnaire was 13.27 ± 3.79 (Table 2). The three items with the highest scores were: "It is vital that family members stay at the patient's bedside until death", "Complementary therapies are important for pain control", and "The use of placebos is appropriate in treating certain types of pain" (**Supplementary Table 2**).

Table 2. Palliative Care Quiz for Nursing and scores in each dimension.

Dimension	$\bar{x} \pm s$	Ranking
Palliative Care Quiz for Nursing	13.27 ± 3.79	
Psychosocial spiritual support	0.72 ± 0.26	1
Pain and symptom management	0.68 ± 0.20	2
Philosophy and principles of palliative care	0.55 ± 0.28	3

3.1.2 Current Ability of Nurses to Practice Palliative Care

The total PC practice score among nurses was 64.17 ± 15.99 (Table 3). The three highest-scoring items were: "At

Table 3. Palliative Care Self-Report Practice Scale and scores in each dimension.

Dimension	$\bar{x} \pm s$	Ranking
Palliative Care Self-Report Practice Scale	64.17 ± 15.99	
Pain	11.20 ± 3.05	1
Communication	10.83 ± 2.93	2
Patient and family-centered care	10.75 ± 2.99	3
Care at the end of life	10.69 ± 2.98	4
Difficulty in breathing	10.67 ± 2.99	5
Delirium	10.04 ± 3.06	6

Table 4. Palliative Care Difficulties Scale and scores in each dimension.

Dimension	$\bar{x} \pm s$	Ranking
Palliative Care Difficulties Scale	40.88 ± 10.27	
Communication in multidisciplinary teams	7.97 ± 2.38	4
Communication with patients and their families	7.99 ± 2.38	3
Expert support	7.89 ± 2.56	5
Symptom management	8.46 ± 2.54	2
Community coordination	8.57 ± 2.96	1

the end of life, I evaluate the appropriateness of care (e.g., positioning, suctioning, physical restraint, blood tests, urinalysis, infusions)", "I evaluate the effectiveness of emergency pain management", and "I choose a quiet and private place to discuss important matters with the patient and family" (**Supplementary Table 3**).

3.1.3 Challenges in the Palliative Care Practice

The total PC difficulty score was 40.88 ± 10.27, indicating a moderate level of perceived challenges (Table 4). The three most commonly reported challenges were "not having the necessary palliative care training", "difficulty in sharing information between hospitals and home care facilities", and "difficulty in obtaining information on home care for end-of-life patients" (**Supplementary Table 4**).

3.1.4 Correlation of Knowledge With Difficulty and Practical Ability

A Pearson correlation analysis was conducted to assess the association of nurses' PC knowledge with perceived difficulty and PC practice scores. The correlation coefficient was used to indicate the strength of the association. No significant correlation was found between the knowledge score and practice scores (r = –0.012, p = 0.738), nor between the difficulty scale scores and practice scores (r = –0.031, p = 0.399). However, a statistically significant negative correlation was observed between knowledge scores and difficulty scores (r = –0.080, p = 0.031) (Table 5).

Table 5. Correlation of nurses' PC knowledge score with difficulty scores and practice scores (n = 723).

Item	1	2	3
1 Knowledge score	1		
2 Difficulty scale score	–0.080*	1	
3 Practical ability score	–0.012	–0.031	1

Note: *$p < 0.05$.

PC, palliative care.

3.1.5 Multivariate Regression Analysis of Palliative Care Practice Ability

Univariate analyses (**Supplementary Table 1**) identified ten variables associated with differences in PC practice competency. All of these variables were initially included in the multiple linear regression model. Multicollinearity was assessed using the Variance Inflation Factor (VIF) and Tolerance, with VIF >10 and Tolerance <0.1 indicating severe multicollinearity. Based on these diagnostics, the final model retained six variables that did not exhibit multicollinearity: workplace, gender, age, years of working experience, professional title, and willingness to participate in PC voluntarily.

Regression analysis showed that gender had a significant effect on PC practice behavior scores (β = 6.64, t = 2.68, p = 0.008). Female participants scored 6.64 points higher than males, demonstrating a significantly higher level of PC competency among females (β = 6.64, p = 0.008). Similarly, age was also observed as a significant indicator of PC practice ability scores. Compared with nurses aged 21–30 years, those aged 31–40 years had scores higher by 4.40 points (β = 4.40, t = 2.20, p = 0.028), and those aged ≥41 years had scores higher by 6.93 points (β = 6.93, t = 2.01, p = 0.045), indicating that increasing age is associated with better PC practice ability. Furthermore, willingness to participate in volunteer PC significantly affected practice scores (β = –2.86, t = –2.08, p = 0.038). Nurses who were unwilling to participate in PC practice had scores 2.86 points lower than those willing to provide such volunteer services (Table 6).

3.2 Findings From Qualitative Survey Data

Thematic analysis of interview data yielded three primary themes and their respective sub-themes: (1) PC knowledge: comprising clarity regarding the service content and scope, existing knowledge gaps, lower public awareness, and nurses' personal willingness and competency. (2) PC practices: encompassing skill deficiencies, challenges in symptom control, variability in institutional commitment to PC training, and the impact of family member behaviors. (3) Practice challenges: including the lack of standardized clinical protocols and limited access to analgesics, environmental barriers (e.g., bed shortages), limited governmental and insurance support, limited resources and time, challenges in transitioning from curative to palliative

Table 6. Multivariate regression analysis of palliative care practice ability.

Variable		β value	Standard error of β value	t	p-value
Workplaces	Tertiary Hospital				
	Secondary Hospital	–2.47	1.46	–1.69	0.091
	Community health center	2.60	2.31	1.13	0.260
	Medical institutions	3.04	2.77	1.10	0.274
Gender	Male*				
	Female	6.64	2.48	2.68	0.008
Age (years old)	21–30*				
	31–40	4.40	2.00	2.20	0.028
	≥41	6.93	3.45	2.01	0.045
Years of working experience	<5				
	6–10	–0.77	1.99	–0.38	0.701
	11–15	–3.27	2.89	–1.13	0.258
	≥16	–1.52	3.55	–0.43	0.668
Professional title	Nurse				
	Senior nurse	–1.73	2.03	–0.85	0.394
	Supervisor nurse	–1.72	2.78	–0.62	0.537
	Co-chief nurse	–3.94	4.00	–0.99	0.324
	Chief nurse	2.69	5.70	0.47	0.637
Would you like to volunteer in palliative care?	Yes*				
	No	–2.86	1.37	–2.08	0.038

Note: * indicates the control group.

Table 7. Demographic and professional characteristics of the eight participants.

Interview number	Age (years old)	Years of work experience	Position	Professional title	Institution type	Interview duration (min)
A	36	11	Nurse	Nurse Practitioner	Medical-Nursing Institution	31
B	45	22	Hospital President	Charge Nurse	Medical-Nursing Institution	52
C	34	10	Specialized Nurse	Nurse Practitioner	Community	30
D	45	25	Head Nurse	Associate Chief Nurse	Community	31
E	39	16	Specialized Nurse	Charge Nurse	Secondary Hospital	45
F	26	3	Nurse	Nurse	Secondary Hospital	29
G	37	14	Head Nurse	Charge Nurse	Tertiary Hospital	32
H	35	11	Specialized Nurse	Charge Nurse	Tertiary Hospital	50

goals, and the lack of well-structured and systematic training.

3.2.1 PC Knowledge

3.2.1.1 Clear Understanding of the Content of PC Services. All eight nurses who participated in the interviews (Table 7) also remained part of the quantitative survey. They agreed that the primary goals of PC are to provide comprehensive support, alleviate patient suffering, promote appropriate and proportional treatment, and help patients spend the end of their lives with dignity and without regrets. Although current PC units are usually staffed by nurses transferred from other departments, these nurses had a basic understanding of the essential components of PC services.

One participant described PC as follows: "*Palliative care primarily concerns the stage when the patient is approaching the end of life (...) We should be their pillar of strength and source of support, helping them feel relaxed in their last days of life, maintain a good spirit and a positive emotional state, and improve their quality of life.*" (Interviewee A).

The interviewees also emphasized that PC extends beyond patient support to family members. As one participant stated: "*The first priority is symptom management, the second is comfort care, and this includes psychological and emotional support, because palliative care is not only for the patient but also for the family, (...) There is actually a great deal involved.*" (Interviewee H).

3.2.1.2 Impact of Professional Commitment and Intrinsic Qualities on Service Quality. Interview findings revealed that nurses' professional commitment and intrinsic qualities are key determinants of PC services. Most respondents emphasized that nurses who have a strong interest in PC and exhibit compassion, attentiveness, and patience, are better suited to provide high-quality care. For instance, Interviewee G stated: "*First and foremost, one must be genuinely interested in this work and recognize its value; there needs to be an inner sense of mission. Care providers must be kind-hearted and genuinely empathetic. If this kindness and sincerity are lacking, patients can easily perceive it.*"

3.2.1.3 Role of Life Experience and Social Maturity in Establishing Nurse-Patient Trust Relationships. This study also revealed that nurses' life experience and social maturity contribute positively to the establishment of trusting nurse-patient relationships. As Interviewee B described: "*Younger nurses may find this aspect more challenging. Those of us in our forties or fifties, with more life experience, can often connect with patients more easily and gain their trust.*"

3.2.1.4 The Lack of Professional Expertise in Palliative Care. This analyses consistently found that nurses lacked professional knowledge in PC, particularly related to pain management, psychological support, disease-related information, care of terminally ill patients, and post-death procedures. These gaps underscore critical shortcomings that must be addressed to improve PC services in China and indicate the key priorities for developing PC teams. For example, one participant stated: "*Currently, team stability is one issue, and another is our capability; our specialist skills, professional knowledge are relatively weak.*" (Interviewee A).

Several interviewees also mentioned that an inadequate understanding of disease progression and prognosis limited patients' PC choices. As one participant noted: "*Sometimes we really want to explain things to them so they can plan the rest of their life, but we don't know how to start the conversation.*" (Interviewee E).

3.2.1.5 A Lack of Social Knowledge and a Need for Further Education. Most responders reported that a culture of filial piety, concepts of life and death, and the taboo of discussing death significantly halt the development and implementation of PC. Shaped by traditional cultural norms, most patients and their family members feel fear, helplessness, or even despair when discussing death. Given the lack of religious belief and spiritual support for coping with death, promoting a clear and balanced understanding of life and death remains a significant challenge in China. As one participant stated: "*When we discuss death and bring it near the end of a patient's condition, they become very sensitive; they do not want even to talk about death. (...) They feel it brings bad luck. That's the traditional Chinese way of thinking.*" (Interviewee H).

Moreover, the responders agreed that public awareness and promotion of PC are severely insufficient. They emphasized that improved education and outreach can increase public acceptance and support smoother adoption of PC services. For example, one participant stated: "*Patients today are comparatively well-educated and more open to accepting new ideas, with appropriate public awareness; in theory, public acceptance of PC would continue to rise.*" (Interviewee E).

3.2.2 Current Status of Palliative Care Behavior

3.2.2.1 Lack of Palliative Care Expertise in Routine Practice. In routine practice, nurses are supposed to complete multiple assessment forms for each patient admitted to a PC facility and formulate a targeted care plan based on these findings. All respondents reported lacking adequate competence in these professional assessment skills. For example, one participant stated: "*(...) You have to be proficient in scoring the various forms before you can proceed. This is the first step, and some nurses in the PC unit have not yet mastered it.*" (Interviewee A).

Moreover, another participant explained the initial uncertainty in evaluation tools: "*At the beginning, we didn't know which assessment tools to use. Later, we practiced and used them as a reference. We eventually observed that the assessment of the survival period was very accurate, which supported patient nursing plans.*" (Interviewee E).

This study further demonstrated that the participants generally lacked skill in various domains of end-of-life care, including death education, grief counseling, terminal disease notification, post-death care, psychological support for families after death, and effective communication. These limitations highlight the need for comprehensive PC training. For example, a participant mentioned: "*The care provided after death was not satisfactory. One patient vomited badly after the gastric tube was removed after death, and the family members were hoarse and exhausted.*" (Interviewee H).

3.2.2.2 Symptom Management is Challenging. Managing pain and other symptoms was reported as a major challenge in PC practice, particularly related to pain, breathing, delirium, and skin problems. Interviewee A explained symptom management as: "*There was a patient whose pain couldn't be managed with routine analgesics. I tried to explain to him what palliative care involves and how we planned to manage his suffering. (...) However, the family members felt that we were cheating them; [Laughing], it was not what they had imagined.*" While Interviewee H noted: "*During nursing care, it is difficult to relieve patients' pain and dyspnea, as well as indicators such as delirium and other symptoms.*"

3.2.2.3 Role of Family Behavior in Palliative Care. The participant reported that the degree of support, education level, and economic conditions of a patient's family significantly affect the smooth implementation of palliative care. If patients' families create a healthy and harmonious environment, maintain good communication with the patient, and handle disagreements rationally, patients are more likely to feel respected, and, in turn, family members gain strength from the patient's positivity. Thus, family support plays a critical role in ensuring effective nursing care. As Interviewee F added: "*Some family members have a higher level of education, so it is easier for us to communicate.*"

Interviewee E emphasized: "*The degree of family concern and support has a significant impact on the patient's emotional well-being.*"

3.2.2.4 The Willingness of Nurses to Participate in Training Varies Significantly Across Institution Types. There were significant variations in nurses' willingness to participate in specialized PC training across healthcare institutions. Compared with those working in private hospitals, nurses in other health settings, such as public hospitals, demonstrated a stronger motivation to engage in comprehensive training programs.

Interviewee B, working in a private hospital, reported: "*There is low enthusiasm among staff for training. We previously selected personnel for a two-month advanced training program, but the process was extremely challenging. Some employees are reluctant to endure the hardship; they believe that their current skills are sufficient to perform their duties in a private hospital setting and feel no need for further professional development. This is especially true for those who are no longer required to work night shifts, as they lack motivation to pursue continued learning.*"

In contrast, Interviewee F emphasized additional education: "*Specialized skills such as psychological management of pain, pain assessment techniques, and positioning care all require systematic training. Moreover, our knowledge of aromatherapy, psychological principles, and communication skills remains basic. I personally feel an urgent need for further training in end-of-life education, as my current understanding in this area is still limited.*"

3.2.3 Challenges in Palliative Care Practice

3.2.3.1 A Lack of Clinical Norms and Authorization of Pain Relief Medicines. This study found that the lack of standardized service for PC in clinical practice, along with a narcotic drug management system that is not matched with the PC pilot program, has seriously affected the effective implementation of these services. Consequently, these services often become formalities and fail to reflect the core principles of PC. Interviewee D stated: "*We don't even have analgesics for terminal cancer patients. In our community hospital, there are regulations, and many types of drugs cannot be prescribed.*"

Several responders explained that the division of responsibilities between physicians and nurses is poorly defined. Consequently, PC remains a mere formality, nursing care does not reflect the original objective of PC, and nurses' ability to enhance their PC practice is severely affected. This issue requires urgent attention from healthcare authorities. As Interviewee D stated: "*In principle, PC should involve a strong collaboration between physicians and nurses, but at present most of the work is done by nurses. (...) I think the policy needs to clearly specify their responsibilities so that PC can truly be implemented.*"

3.2.3.2 Insufficient Hospital Beds and a Lack of Religious Facilities. Participants also reported that some of the institutions involved in the PC pilot program either lack dedicated wards or have an insufficient number of beds. They further mentioned a lack of facilities and spaces to support patients' religious practices, which has, to some extent, limited the development of PC services. As Interviewee D observed: "*There are only a few beds, and we have already suggested that the number should be increased. In addition, environmental settings and patients' religious beliefs must be considered.*" Similarly, Interviewee C stated: "*Religious belief is a source of spiritual comfort for patients and can provide them with positive strength. However, such resources are not always available. Patients who believe in Buddhism or Christianity, for example, may hope for this kind of support, but it cannot be provided.*"

3.2.3.3 The Government Has Invested Little, and the Medical Insurance Policy does not Match. Some interviewees noted that the government support for the PC pilot programs not only promotes public acceptance and awareness but also encourages hospitals to provide these services. For example, Interviewee A stated: "*The government has also reached out to us, and the Health and Family Planning Bureau and Hospitals give great importance to this. However, the cost of PC is high, and insufficient funding affects the effective implementation of these services.*"

Some interviewees pointed out that existing compensation policies, including medical insurance, are insufficient, and that financial support for these practices remains low. In particular, providers of PC are unable to charge for services beyond treatment fees, making it difficult for hospitals to remain financially sustainable. Additionally, inconsistencies between the Hangzhou medical insurance reimbursement system and the PC pilot program have significantly limited the provision of such services. As Interviewee D stated: "*There is no charge for palliative care, but if my patient does not receive these services, I can charge for a consultation. For example, I can charge for a blood glucose test or a dressing change.*"

3.2.3.4 Time, Human Resources, and Communication Required. Interview results identified that a critical shortage of human resources is a major barrier to effective PC delivery, leading to limited time, inadequate communication, and compromised service quality. All interviewees highlighted that nurses already carry a heavy workload and that the PC requires significant time and communication, with current inadequate staffing levels.

This shortage limits service continuity and depth, and the absence of a well-established interprofessional collaboration mechanism exacerbates the time and communication burden on individual practitioners. For instance, Interviewee D reported: "*Doctors also lack the willingness to invest time in PC; they often prioritize medical services with higher economic returns. Currently, most home-based services are performed by nurses. Although there are more nurses than physicians, the number is still far from meeting the actual demand.*" Interviewee E added: "*This work requires significant time investment. We often have to use our own rest time to complete it. Relying solely on working hours makes it difficult to provide systematic and detailed PC services.*" Similarly, Interviewee A emphasized: "*It is challenging for us to provide 100% dedicated care to a single patient; we simply cannot guarantee the time.*"

Collectively, these narratives indicate that insufficient human resources are the underlying cause of time constraints and communication gaps in PC nursing. The lack of a systematically trained team prevents nurses, as primary care providers, from effectively coordinating communication or delivering comprehensive services. The theme that emerges, "Insufficient Human Resource Allocation Constrains Service Delivery, Highlighting the Urgent Need for Enhanced Communication and Time Investment", captures the recurring pattern in the data: inadequate staffing restricts service delivery by limiting the time available for patient care and communication, ultimately compromising service quality. This pattern accurately reflects the interconnected challenges repeatedly observed in the interview data.

3.2.3.5 A Lack of Systematic Training and Simulation Teaching. The study identified a lack of systematic professional training in PC, resulting in widespread knowledge gaps in areas such as life-and-death education, grief counseling, and end-of-life guidance. Nurses require specific competencies, including patience, advanced communication skills, clinical experience, and psychological counseling abilities, underscoring the need for targeted training to enhance their knowledge and skills. Some interviewees also noted that, despite opportunities for overseas training, the absence of specialized nursing teams and qualified trainers limits access to comprehensive, professional, and standardized education. As Interviewee H stated: "*No one in our department has received systematic training except me. It is difficult for them to learn how to care for a patient throughout the entire process, from admission to discharge.*"

Similarly, Interviewee F noted: "*I benefited a lot from the head nurse and senior teachers, who taught me how to handle patients' clinical changes. It was more helpful than the formal training I received.*"

3.2.3.6 Difficulties in Transitioning From Curative to Palliative Care. All interviewees identified the transition from active treatment to PC as a common yet particularly challenging aspect of clinical practice. Nurses reported difficulty in initiating these conversations and felt inadequately trained in the communication skills required. This process involves a fundamental shift in treatment goals and highlights the issue of "therapeutic persistence". Despite advantages like multidisciplinary support in general hospitals, significant barriers remain in persuading patients and families to accept PC.

As Interviewee B acknowledged: "*Initiating the suggestion of PC itself is extremely difficult. The entire transition process is highly complex and requires sufficient time for preparation and communication.*" Interviewee C added: "*The main challenge we face is how to suggest the transition to PC in a way that is appropriate and convincing, without coming across as forceful or subjective. In practice, this is very difficult to achieve.*"

4. Discussion

4.1 Factors Influencing Palliative Care Practice Ability: A Multivariate Analysis

Multivariate regression analysis identified gender, age, and willingness to participate in PC-related volunteer services as three independent factors influencing practice ability scores.

Age demonstrated the strongest impact on palliative care practice ability. Compared with nurses aged 21–30 years, those aged 31–40 scored 4.40 points higher (B = 4.40, t = 2.20, p = 0.028), and those aged 41 and above scored 6.93 points higher (B = 6.93, t = 2.01, p = 0.045). With increasing age, nurses usually gain more work experience and advance in professional title; accumulated clinical exposure and social experience are likely to contribute to enhanced competency. Given that PC is a highly specialized field that requires substantial practical experience and interpersonal understanding, it is possible to explain the positive correlation between age and practice ability. This suggests that administrators should promote PC training widely across pilot sites, enabling more nurses to be introduced to PC concepts and practice earlier in their careers and refine their abilities through ongoing clinical practice. Team composition should also consider age distribution to enhance the quality of PC services.

Second, female nurses scored significantly higher in practice ability than male nurses, which may be associated with greater patience, attentiveness, and detail orien-

tation often observed among female practitioners. As the number of male nurses increases, they are playing increasingly important roles across specialties, particularly in operating rooms, emergency departments, intensive care units (ICUs), and psychiatric units, while remaining less represented in general wards. Evidence indicates that traditional gender stereotypes may lead some male nurses to perceive nursing as having limited career prospects, which can reduce professional commitment and contribute to variability in performance and competency. Therefore, administrators should provide targeted guidance and support for male nurses, implement evidence-based management approaches, enhance their professional identity in palliative care, and promote continuous improvement in service quality to support the development of these services.

Finally, personal willingness also plays an essential role in enhancing PC competency. Nurses who showed willingness to participate in palliative care scored significantly higher in practice ability than those who were unwilling. Such willingness is often driven by emotional motivation, job satisfaction and emotional engagement function as intrinsic drivers of performance. Given that palliative care involves long-term contact with patients at the end of life, interest in this field is typically shaped by the broader social and cultural environment rather than emerging spontaneously. These observations highlight the need for managers to respect nurses' personal preferences, foster internal motivation, enhance subjective initiative, and strengthen public awareness and understanding of PC.

4.2 Analysis of the Current Situation and Challenges in Palliative Care Nursing

In this study, the nurses scored lowest in the community coordination domain, consistent with the results reported by An *et al*. [15]. This study involved nurses from four tertiary general hospitals in Beijing. The findings may reflect the relatively recent introduction of palliative care in China; for instance, Hangzhou's pilot program was commenced just over two years ago, and managerial emphasis on community-based and interdepartmental coordination remains limited. The significant difficulties nurses reported in symptom management and communication align with findings from international studies. Many nurses have experienced considerable challenges in managing symptoms, communicating with multidisciplinary professionals, and obtaining support from palliative care specialists [16]. Multidisciplinary teamwork can help address the multidimensional needs of terminally ill patients. Evidence has shown that team-based interventions can alleviate symptoms, such as pain, dyspnea, weakness, fatigue, nausea, vomiting, and edema, indicating that effective communication and strong multidisciplinary support have positive effects in palliative care [17]. These findings suggest that in the future, coordinated measures should be implemented at both the nursing and governmental levels.

This study further revealed a negative association between palliative care knowledge and perceived difficulty, indicating that higher knowledge levels are linked with lower levels of difficulty in practice. Thus, knowledge and behavior are substantially correlated. These findings are consistent with those of Zhou *et al*. [18]. As one researcher has pointed out, "The problem facing the nursing profession is that theory does not guide practice, nor are theory and practice combined." Bökberg *et al*. [19] further reported that nurses' PC knowledge and perceived difficulties improved significantly after interventions. These results suggest that managers should strengthen education and training and better combine theory with clinical practice to effectively enhance nurses' practice ability in PC.

4.3 Increase Financial Input and Rationalize Supporting Mechanisms

Palliative care is a holistic model that addresses the physical, psychological, social, and spiritual needs of patients and their families. It involves multiple providers and is limited by funding, staffing, and ethical risks. To support its development, the government should emphasize the public welfare nature of PC, improve systemic mechanisms, increase financial investment, and refine medical insurance reimbursement policies to enhance institutional pilot programs.

This study found that high service costs and insufficient funding significantly hinder effective PC service delivery. Moreover, due to incomplete insurance policies, providers, particularly those delivering home-based care, are unable to charge for services beyond basic treatment costs. As workload has increased while reimbursement has decreased, most pilot institutions struggle to remain financially sustainable [20]. Furthermore, support from ancillary medical institutions is also critical. Thus, the authority for palliative care institutions to prescribe necessary anesthetic and analgesic drugs should be appropriately expanded at all levels to enable the implementation of home-based and community day-care services.

Evidence shows that although palliative care has made some advances in recent years, overall social participation is generally low, and patients and their families often lack an accurate understanding of its value [21]. Most family members equate PC to giving up treatment and therefore favor active interventions, often neglecting patients' quality of life and resulting in unnecessary suffering [22].

In the current medical environment, patients and families tend to place greater trust in doctors than in nurses. Therefore, enhancing interprofessional collaboration and communication is essential in PC practice. Enhanced collaboration can help them better understand their illness, accept the clinical reality, and make informed decisions aligned with their values and preferences [22].

4.4 Improve the Practice Environment of Palliative Care and Enhance Nurses' Palliative Care Practice Ability

Interviewees reported opportunities for annual internal and external training. They further stated that knowledge acquisition is fragmented, primarily sourced from clinical case summaries and departmental lectures, and lacks systematic professional instruction. Consequently, managers should enhance nursing education by developing structured curricula that strengthen application and establish a comprehensive palliative care knowledge system. Incorporating simulation-based and experiential teaching could help develop a new educational model for palliative care training, enriching current strategies [23,24].

Research indicates that a lack of palliative care knowledge leads to unfamiliarity with work processes and limited practical experience, ultimately decreasing clinical practical abilities [25]. Optimizing education and training methods is therefore crucial to enhancing nurses' PC knowledge and preparing them to provide comprehensive and professional support to end-of-life patients and their families.

Consistent with previous evidence [26], many nurses experienced considerable difficulties in symptom control, communication with multidisciplinary professionals, and obtaining support from palliative care specialists. It has been reported that multidisciplinary teamwork can address the complex, multidimensional needs of terminally ill patients, with team-based interventions in symptoms, such as pain, dyspnea, weakness, fatigue, nausea, vomiting, and edema, thereby reflecting the beneficial impact of multidisciplinary support in palliative care [27]. Enhancing interprofessional collaboration and enabling access to expert input should therefore be a key managerial priority.

4.5 Comparison of Palliative Care Status Between China and Other Countries

In many high-income countries, palliative care has been integrated into healthcare systems, supported by well-established policies, standardized clinical practices, and robust multidisciplinary collaboration. For instance, in the United Kingdom and Australia, palliative care is supported by comprehensive national policies, adequate funding, and extensive community involvement. These systems emphasize the synergy between medical institutions and communities, ensuring seamless transitions for patients across different levels of care. Additionally, palliative care education and training are systematically incorporated into nursing and medical curricula, thereby enhancing the professional competencies of healthcare providers.

In contrast, palliative care in China remains at a nascent stage of development and is characterized by uneven progress and significant urban-rural variations. The policy support is fragmented, funding is insufficient, and PC is not yet fully integrated into mainstream medical education. Moreover, public awareness and acceptance of palliative care remain low, often hindered by cultural biases and misconceptions about death and end-of-life care. Learning from international experience, China should prioritize the formulation of uniform national policies, increase financial investment, and promote public education to foster a more supportive environment for palliative care development.

4.6 Limitations

Funding and human resources (staffing) limitations restricted this study to the Hangzhou region, which may affect the generalizability and representativeness of the findings. Future studies should increase the sample size and extend geographical coverage to comprehensively capture the broader landscape of PC development. Expanding the scope in this way would offer a strong empirical basis for policy formulation and for designing educational and training programs.

5. Conclusion

The findings of this study indicate that nurses in Hangzhou demonstrate intermediate to high levels of practical palliative care ability and knowledge, while reporting moderate levels of perceived difficulty in practice. Nevertheless, significant gaps remain in meeting the requirements for high-quality palliative care delivery, particularly symptom management and communication. There is an urgent need to establish systematic and specialized training programs to enhance nurses' practical competencies across multiple dimensions. Building palliative care service capacity is a complex, system-level task that requires deep collaboration among government agencies, society, and healthcare institutions. Priority actions should include optimizing the allocation of medical resources, improving supporting policies such as medical insurance reimbursement, establishing specialized, structured training systems for PC professionals, and improving public education to promote more informed and appropriate understandings of end-of-life care.

Key Points

• This mixed-method approach systematically evaluated the current state of palliative care practice competence among nurses in Hangzhou and revealed that, although performance was above average, it remained significantly inadequate to meet clinical needs.

• Quantitative analysis identified gender, age, and willingness to engage in voluntary services as independent predictors of practical competence.

• Qualitative findings further uncover multidimensional challenges at the cognitive, behavioral, and practical levels.

• Integrated findings demonstrate that personal willingness, professional understanding, social support, and education and training collectively constitute core factors of practical competency.

• The study concludes that establishing systematic and specialized training and assessment mechanisms is crucial for enhancing nurses' practical capabilities.

• Overall, the study emphasizes the need for multi-dimensional coordination—including policy optimization, resource allocation, and public awareness campaigns—to systematically enhance the capacity of palliative care services.

Availability of Data and Materials

The data used to support the findings of this study are available from the corresponding author upon reasonable request.

Author Contributions

Acquisition, analysis, or interpretation of data for the work: XY, LN, LW, QQW, YML. Drafting the work: XY, QQW. All authors contributed to revising the manuscript critically for important intellectual content. All authors read and approved the final manuscript. All authors have participated sufficiently in the work and agreed to be accountable for all aspects of the work.

Ethics Approval and Consent to Participate

This study was conducted in accordance with the Declaration of Helsinki and received ethical approval from the Institutional Review Board of Hangzhou First People's Hospital (No. ZN-20220905-0143-01). The study design strictly adhered to the principles of informed consent, confidentiality, justice, and beneficence. Furthermore, written informed consent was obtained from each participant.

Acknowledgment

We gratefully acknowledge the financial support received from the Ministry of Education Industry-University Cooperative Education Program (220500576054305), the Hangzhou Medical and Health Science and Technology Project (A20241479), and the Design and Application of Zhejiang Provincial Medical and Health Science and Technology Program (2023KY932).

Funding

This research received no external funding.

Conflict of Interest

The authors declare no conflict of interest.

Supplementary Material

Supplementary material associated with this article can be found, in the online version, at https://doi.org/10.31083/BJHM50391.

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