

Bridging the knowledge gap: Attitudes and competencies in palliative care among community health nurses in Urban China

 Zihan Zhao¹,  Mary Beth P. Diva²,  Sheilla M. Trajera³,  Gregory S. Ching^{4*}

¹Graduate School, University of St. La Salle, Bacolod City 6100, Philippines; Nursing Department, Xuzhou Medical University, Xuzhou City, Jiangsu Province 221000, China; s0885428@usls.edu.ph; zzh1happy@163.com (Z.Z.)

²Faculty, BSN, MN, and PhD Programs in Nursing, University of St. La Salle, Bacolod City 6100, Philippines; m.diva@usls.edu.ph (M.B.P.D.)

³Faculty, BSN, MN, and PhD Programs in Nursing, University of St. La Salle, Bacolod City 6100, Philippines; s.trajera@usls.edu.ph (S.M.T.)

⁴Faculty, Graduate Institute of Educational Administration and Policy, National ChengChi University, Taipei City 11605, Taiwan; gching@nccu.edu.tw (G.S.C.).

Abstract: This current study examined the attitudes and knowledge of community health nurses (CHNs) regarding palliative care (PC) and explored key factors influencing these competencies in a non-pilot urban setting in China. A cross-sectional survey was conducted among 206 CHNs in Xuzhou using cluster sampling. Participants completed a demographic questionnaire, the Chinese version of the Frommelt Attitude Toward Care of the Dying Scale (FATCOD-B), and the Palliative Care Knowledge Test (PCKT). Results showed that CHNs held generally positive attitudes (mean FATCOD-B = 103.23 ± 9.25), but demonstrated only moderate knowledge (mean PCKT score = 9.24 ± 2.15 ; 54.39% accuracy). Regression analysis identified religious beliefs, experience in caring for the terminally ill patients, and PC training as significant predictors of attitude. Knowledge levels were also significantly associated with experience and training. Despite their willingness to provide compassionate care, many nurses lacked formal preparation, especially in opioid use and symptom management. The findings highlight the urgent need for structured education and targeted training programs to enhance PC capabilities among CHNs. Improving these competencies will be critical to expanding access to quality end-of-life care in community settings, particularly in regions not currently prioritized by national policy.

Keywords: China, Community health nursing, End-of-life care, Knowledge assessment, Nurse training, Nursing attitudes, Palliative care.

1. Introduction

China's population is aging rapidly [1] with chronic diseases and cancer emerging as the leading causes of death [2]. By 2020, millions of elderly individuals in China were diagnosed with chronic illnesses, comprising over a large part of the aging population [3, 4]. The World Health Organization also ranked China highest globally for newly diagnosed cancer cases and deaths during the same year [5], while similar trends follow through to 2022 [6]. These demographic and health transitions have created an urgent need for high-quality, accessible end-of-life care, particularly palliative care (PC) [7] not only in China, but also in other countries as well [8]. These actually addresses the multidimensional needs of patients, such as: physical, emotional, social, and spiritual, of patients facing life-limiting conditions [9].

PC is internationally recognized as a cornerstone of compassionate, patient-centered care [10]. It improves quality of life, alleviates suffering, and supports families through bereavement, while also

contributing to the more efficient use of healthcare resources [11]. In community settings, where many patients prefer to spend their final days, community health nurses (CHNs) are essential providers of PC services [12]. However, despite growing demand and policy momentum, the development of PC services in China remains uneven [13]. Currently, only a small amount of dying patients in China receive formal PC, and resources are concentrated in urban hospitals or designated pilot cities [7]. Existing research has largely focused on PC in hospital or hospice settings, with minimal attention to CHNs in non-pilot cities [14]. Studies assessing nurses' attitudes and knowledge are often limited in scope [15], frequently relying on self-developed tools with limited validity. Moreover, many of these studies yield inconsistent findings, particularly regarding what factors influence nurses' willingness or readiness to deliver PC [16]. As China seeks to expand PC services into primary care and community-based settings [17], understanding CHNs' competencies is critical.

Given their frequent contact with terminally ill patients in the community, CHNs' knowledge and attitudes directly affect the quality of care delivered. A nurse's attitude can influence both the emotional environment of the patient and the decision to engage proactively in care planning [18]. Similarly, knowledge of PC principles, especially regarding symptom management and communication, impacts clinical judgment [19]. However, gaps in training, exposure, and professional development opportunities may undermine nurses' capacity to provide effective PC [20]. Therefore, understanding these gaps is essential for informed policy and education interventions.

This study is anchored in Frommelt's Theory of Attitudes Toward Care of the Dying [21], which emphasizes the affective and cognitive components shaping nurses' willingness to engage in end-of-life care. Importantly, attitudes are influenced by personal experiences, beliefs, and educational exposure. In parallel, knowledge acquisition is framed by the Knowledge-to-Action (KTA) framework [22] which posits that evidence-based knowledge must be transferred and contextualized through education and practice to improve outcomes. Together, these perspectives guided the use of validated instruments (Frommelt Attitude Toward Care of the Dying Scale, Form B; FATCOD-B [21] and Palliative Care Knowledge Test; PCKT [23]) and informed the selection of predictors such as religious beliefs, clinical exposure, and training history in analyzing nurse competencies in PC.

This study contributes to the growing body of literature on PC by focusing on a critical yet under-researched population: CHNs in non-pilot Chinese cities. Unlike prior studies confined to large urban centers or hospital contexts, this research captures real-world conditions in secondary urban areas where resources are fewer and nurses often operate with less institutional support. The findings offer evidence-based insights to inform PC training curricula, continuing professional education programs, and government efforts to decentralize PC delivery. Moreover, this study can help health administrators identify priority areas for improving community-based PC services, especially amid rapid demographic shifts.

The primary aim of this study is to assess the attitudes and knowledge of CHNs in Xuzhou, China, regarding PC and to identify the key factors that influence these competencies. Specifically, the study seeks to:

- Evaluate the overall attitudes of CHNs toward PC using the FATCOD-B scale.
- Assess the level of PC knowledge among CHNs using the PCKT scale.
- Identify demographic, experiential, and educational factors that significantly predict attitudes toward PC.
- Determine the key predictors of PC knowledge among CHNs.

2. Literature Review

2.1. The Development and Significance of Palliative Care

PC has emerged as a distinct discipline within modern nursing, grounded in the principles of humanistic and holistic care [24]. It provides comprehensive support for the physical, emotional, social, and spiritual, to patients facing life-limiting conditions and to their families [8, 15]. The goal of PC is

not only to improve the quality of life and dignity of terminally ill patients, but also to optimize healthcare resource use by reducing unnecessary hospital admissions and interventions [25, 26]. As healthcare systems globally grapple with aging populations, countries such as the United Kingdom, the United States, Japan, and Taiwan have developed diverse models of PC services, including home-based, community-based, and hospital-based care [27, 28].

2.2. Community-Based Palliative Care and the Role of Community Health Nurses

Within the diverse PC service, community-based PC plays a crucial role in fulfilling patients' desires to receive end-of-life care in a familiar and supportive environment [29]. In reality, the community-based health centers do play an important role in facilitating healthcare for the needy with the immediate vicinity. It reduces the burden on tertiary hospitals, while allowing patients to remain close to family, often increasing satisfaction with care and lowering readmission rates [30]. Community hospitals and health service centers are well-positioned to provide this care, especially with the involvement of trained CHNs [31, 32]. In China, CHNs serve as educators, caregivers, coordinators, and advocates within community health systems, undertaking responsibilities that range from chronic disease management to home-based terminal care [13]. As the country promotes community-centered healthcare, the competencies of CHNs in delivering PC become increasingly vital.

2.3. Attitudes Toward Palliative Care Among Community Health Nurses

As the role and responsibilities of CHNs evolve, attitudes toward death and dying among CHNs significantly influence their willingness and ability to provide PC [12]. Positive attitudes contribute to compassionate engagement [33], whereas discomfort and fear can lead to avoidance behaviors [30]. Several international studies have shown that nurses with religious beliefs, personal caregiving experience, or formal PC training exhibit more favorable attitudes [8, 34]. However, other studies, such as those conducted in Iran, reveal more negative or ambivalent attitudes, particularly when training and exposure are lacking [35]. In China, research on CHNs' attitudes are sparse, with most investigations focusing on hospital-based nurses or staff in palliative pilot cities [36, 37].

2.4. Knowledge of Palliative Care and Assessment Tools

Knowledge of PC among CHNs is equally crucial, as it underpins the quality and appropriateness of care. Internationally validated tools such as the PCKT [23] and the Palliative Care Quiz for Nursing (PCQN) [38] have been widely used to assess nurses' understanding of pain management, symptom control, and ethical aspects. Research in countries like the United Kingdom and Japan shows that while basic knowledge levels are moderate, ongoing professional development is required [39, 40]. In contrast, CHNs in China often demonstrate lower knowledge scores, particularly in areas such as opioid use and symptom relief [41]. Domestic studies also report that PC education is underdeveloped, sporadic, and lacking standardization [36].

2.5. Factors Influencing Attitudes and Knowledge

Multiple factors influence CHNs' attitudes and knowledge levels, including education level, professional title, years of experience, and training history. International studies have repeatedly demonstrated that nurses with PC training or experience in caring for dying patients tend to score higher in both knowledge and attitudes [15, 42]. Religious beliefs also appear to shape attitudes by reinforcing values of compassion and acceptance of death [43, 44]. In China, few studies systematically examine these predictors among CHNs. Where research does exist, it is largely confined to better-resourced cities and often employs self-designed instruments that limit generalizability [45, 46].

2.6. Synthesis and Conceptual Link

The literature reveals clear gaps in both the attitudes and knowledge of CHNs, particularly in non-pilot cities in China, where resources and training opportunities are limited. While previous studies underscore the importance of experience and education, few have integrated these variables into a cohesive framework to explain how they shape readiness for PC. This study addresses that gap by applying Frommelt's Attitude Theory and the Knowledge-to-Action Framework. These frameworks jointly emphasize that both personal and contextual factors, such as beliefs, education, and clinical exposure, interact to influence caregiving behavior. By focusing on CHNs in Xuzhou, a non-pilot city, and employing validated tools (FATCOD-B and PCKT), this study offers theoretically grounded and methodologically sound insights into how to enhance PC competencies at the community level.

3. Method

3.1. Study Design

This study employed a quantitative, cross-sectional descriptive design [47] to assess the attitudes and knowledge levels of CHNs regarding PC and to identify associated influencing factors. The design was chosen to capture a snapshot of current competencies among CHNs in a real-world, non-pilot city setting, using validated measurement instruments for reliable comparison and interpretation. A cross-sectional descriptive design is advantageous for exploring the current status of a phenomenon within a specific population at a single point in time. It allows researchers to collect data efficiently and cost-effectively, making it particularly useful for public health and nursing studies that aim to describe attitudes, knowledge, or behaviors [48]. This design is well-suited for identifying associations between variables and for generating hypotheses for future research [49]. Additionally, because it captures a "snapshot" of the population [50], it is ideal for assessing prevalence or evaluating needs in under-researched settings such as non-pilot regions or community-based care environments.

3.2. Study Locale

The research was conducted in Xuzhou, a prefecture-level city located in Jiangsu Province, eastern China. While not designated as a national pilot site for palliative care, Xuzhou represents a mid-sized urban center with a growing aging population and an evolving community health infrastructure [51]. The city comprises both urban and peri-urban districts, with a network of community health service centers that deliver primary care, chronic disease management, and, increasingly, home-based palliative services [52]. Despite its expanding healthcare network, formal palliative care education and training programs remain limited in scope, making it a suitable locale to explore the readiness and needs of CHNs outside of well-resourced cities like Beijing or Shanghai.

3.3. Participants and Sampling

A total of 206 CHNs were recruited using cluster random sampling [53] from five community health service centers, each randomly selected from five urban districts in Xuzhou. Inclusion criteria were: (1) registered nurses aged 18 or older, (2) at least two years of work experience in community nursing, (3) possession of a valid nursing license, and (4) voluntary participation with the ability to complete the questionnaire independently. Nurses on extended leave or nursing interns were excluded from the study.

Table 1 showed that there is a total of 206 CHNs who participated in the study. The majority were female (98.06%), with only 1.94% identifying as male. The age distribution showed that more than half of the participants (59.22%) were between 26 and 35 years old, followed by 25.24% aged 36 to 45, and 11.17% aged over 45. In terms of educational background, most nurses (82.04%) held a bachelor's degree, while 15.05% had completed secondary vocational education, and only 2.91% held a master's degree. None held a doctoral degree. Regarding professional title, 43.68% had a primary-level title, 39.32% held an intermediate title, and only a small proportion (16.99%) had deputy senior or senior

titles. For years of nursing experience, 37.38% had worked for 11 to 20 years, followed by 33.50% with 6 to 10 years, 15.53% with more than 20 years, and 13.60% with less than five years of experience. In terms of monthly income, 43.20% earned 2,501 to 5,000 Chinese Yuan (CNY; 5,000 CNY is approximately around 690 US dollar as of May 2025), and 36.41% earned 5,001 to 7,500 CNY. Only 3.40% reported earnings above 10,000 CNY. Regarding religious affiliation, 12.14% identified as having religious beliefs, while the majority (87.86%) did not. Notably, 46.60% of participants reported experience in caring for terminally ill patients, and only 19.90% had received formal PC training, indicating a gap in professional development relevant to end-of-life care.

Table 1.

Demographic Background of Participants ($N = 260$).

Demographic	Category	<i>n</i>	%
Age (years)	< 25	9	4.37
	26 – 35	122	59.22
	36 – 45	52	25.24
	> 45	23	11.17
Gender	Female	202	98.06
	Male	4	1.94
Educational Level	Secondary vocational	31	15.05
	Bachelor's degree	169	82.04
	Master's degree	6	2.91
Professional Title	Primary	90	43.68
	Intermediate	81	39.32
	Deputy Senior	30	14.56
	Senior	5	2.43
Years of Experience	< 5	28	13.60
	6 – 10	69	33.50
	11 – 20	77	37.38
	> 20	32	15.53
Monthly Income (CNY)	< 2,500	2	0.97
	2,501 – 5,000	89	43.20
	5,001 – 7,500	75	36.41
	7,501 – 10,000	33	16.02
	> 10,000	7	3.40
Religious Belief	Yes	25	12.14
	No	181	87.86
Experience Caring for Dying Patients	Yes	96	46.60
	No	110	53.40
PC Training Experience	Yes	41	19.90
	No	165	80.10

3.4. Instruments

Data were collected using three structured instruments:

- **Demographic Questionnaire:** A self-developed instrument capturing background variables such as age, gender, education level, professional title, work experience, monthly income, religious beliefs, experience in caring for terminal patients, and prior palliative care training.
- **Frommelt Attitude Toward Care of the Dying Scale – Form B (FATCOD-B):** The Chinese version was used to assess nurses' attitudes toward palliative care [54]. The scale includes 29 items rated on a 5-point Likert [55] type scale. Higher scores indicate more positive attitudes. Cronbach's [56] alpha for the Chinese version is reported at 0.79, which can be considered as adequate internal consistency [47].
- **Palliative Care Knowledge Test (PCKT):** The Chinese version was used to assess knowledge across four domains: philosophy, pain and psychiatric symptom management, dyspnea and gastrointestinal care, and opioid use [57]. The test consists of 17 items with a correct/incorrect

scoring method. Cronbach's alpha was reported as 0.84.

3.5. Data Collection Procedure

Data were collected between October and December 2024. The research team created an electronic version of the survey using the Questionnaire Star platform. Community health managers distributed the link and QR code to eligible CHNs. Participants were given 10 to 15 minutes to complete the anonymous questionnaire online. After data collection, responses were downloaded, screened, and double-checked by two independent reviewers to ensure completeness and consistency.

3.6. Data Analysis

Data were analyzed using IBM SPSS version 27.0. Descriptive statistics (mean, standard deviation; SD, frequencies, and percentages) were used to summarize demographic characteristics and scale scores. Stepwise multiple linear regression analyses were performed to identify significant predictors of CHNs' attitudes (FATCOD-B) and knowledge (PCKT) regarding PC. The significance level was set at $\alpha = .05$, and results were considered statistically significant when $p < .05$.

3.7. Ethical Considerations

The study was reviewed and approved by the Research Ethics Review Committee of the University of St. La Salle, Philippines (Approval Number: STUD-YIBU-007.23-24.T3.GRAD). All participants provided informed consent before completing the survey. Confidentiality was maintained throughout the study, and respondents were informed of their right to withdraw at any time without consequence.

4. Results

4.1. Attitudes Toward Palliative Care Among Community Health Nurses

Table 2 shows the attitudes of CHNs toward PC were assessed using the FATCOD-B scale. The mean total score was 103.23 ± 9.25 , corresponding to an overall mean item score of 3.56 ± 0.32 , which indicates a generally positive attitude. Among the six dimensions of the scale, the highest scores were in "Attitude toward the interests of palliative patients" (4.00 ± 0.42) and "Caring attitude toward palliative patients" (3.64 ± 0.54), suggesting strong support for patients' comfort and dignity. The lowest scores were found in "Attitude toward communicating with dying patients" (2.89 ± 0.54), indicating moderate discomfort or uncertainty in this domain.

Table 2.

Attitudes Toward Palliative Care ($N = 260$).

Dimension	Mean	SD	Interpretation
Attitude toward interests of palliative patients	4.00	0.42	Positive
Caring attitude toward palliative patients	3.64	0.54	Positive
Support needs of patients' family members	3.65	0.28	Positive
Communication with dying patients	2.89	0.54	Moderately Positive
Caring attitude toward patients' family members	3.64	0.41	Positive
Attitude toward fear and uneasiness in dying care	3.34	0.67	Moderately Positive
Overall Attitude Score	3.56	0.32	Positive

4.2. Knowledge Levels in Palliative Care Among Community Health Nurses

PC knowledge was measured using the PCKT. Table 3 shows that the mean score was 9.24 ± 2.15 out of 17, with a knowledge accuracy rate of 54.39%, representing a moderate level. Among the four knowledge domains, "Pain and psychiatric symptom care" had the highest accuracy (72.17%), while "Opioid use" had the lowest (48.27%). These findings suggest a need for targeted educational efforts in pharmacological management and complex symptom care.

Table 3.
Knowledge Levels in Palliative Care ($N = 260$).

Domain	Accuracy (%)	Interpretation
Philosophy	69.42	High
Pain and psychiatric symptom care	72.17	High
Dyspnea and gastrointestinal symptom care	46.12	Moderate
Opioid use	48.27	Moderate
Overall Knowledge Accuracy	54.39	Moderate

4.3. Predictors of Attitudes Toward Palliative Care

Table 4 shows the stepwise multiple regression analysis which identified three significant predictors of nurses' attitudes toward palliative care:

- Religious belief ($\beta = 0.59$, $p = .002$)
- Experience in caring for terminally ill patients ($\beta = 0.24$, $p = .039$)
- Palliative care training experience ($\beta = 1.15$, $p < .001$)

The final model explained 37% of the variance in attitude scores (Adjusted $R^2 = 0.36$, $F = 38.86$, $p < .001$), indicating a moderately strong predictive relationship.

Table 4.
Predictors of Attitudes Toward Palliative Care (FATCOD-B).

Predictor	B	SE B	β	t	p
Constant	3.39	0.03		130.85	< .001
Religious belief	0.20	0.06	0.59	3.19	.002
Experience caring for dying patients	0.08	0.04	0.24	2.08	.039
Palliative care training	0.38	0.05	1.15	7.49	< .001
Model Fit					
$R^2 = .37$, Adjusted $R^2 = .36$, $F = 38.86$, $p < .001$					

4.4. Predictors of Palliative Care Knowledge

Table 5 showed that two significant predictors of knowledge scores emerged from the regression analysis:

- Experience in caring for dying patients ($\beta = 0.22$, $p = .042$)
- Palliative care training experience ($\beta = 1.73$, $p < .001$)

The final model which accounted for 45% of the variance in knowledge scores (Adjusted $R^2 = 0.45$, $F = 83.80$, $p < .001$), indicating that practical and educational exposure are strong determinants of knowledge levels.

Table 5.
Predictors of Palliative Care Knowledge (PCKT).

Predictor	B	SE B	β	t	p
Constant	0.76	0.02		47.02	< .001
Experience caring for dying patients	0.03	0.01	0.22	2.04	.042
Palliative care training	0.23	0.02	1.73	12.90	< .001
Model Fit					
$R^2 = .45$, Adjusted $R^2 = .45$, $F = 83.80$, $p < .001$					

5. Discussions

5.1. Attitudes Toward Palliative Care Among Community Health Nurses

The study found that CHNs in Xuzhou demonstrated generally positive attitudes toward PC, particularly regarding patients' rights to dignity and the importance of compassionate caregiving. This aligns with prior international findings indicating that CHNs often hold favorable attitudes when they have sufficient professional maturity and contextual support [29, 33]. However, the lower scores in the

dimension of communication with dying patients mirror concerns raised in the literature about nurses' discomfort or avoidance behaviors in confronting death [12, 30]. These findings suggest that while CHNs may endorse the values of PC, specific aspects, such as death communication, require targeted support and experiential training.

5.2. *Knowledge Levels in Palliative Care Among Community Health Nurses*

The results revealed that CHNs' overall knowledge level was moderate, with significant deficits in opioid use and symptom management. This is consistent with domestic studies noting that Chinese CHNs lag behind their international counterparts in palliative knowledge due to sporadic training and limited access to structured educational programs [36, 41]. As compared with other countries like the United Kingdom or Japan, where standardized training programs are more integrated into professional development [39, 40], the findings highlight a pressing need for comprehensive and accessible palliative education in China's community health system. These knowledge gaps could compromise care quality, especially in complex symptom management and ethical decision-making.

5.3. *Predictors of Attitudes Toward Palliative Care*

Religious belief, caregiving experience with terminally ill patients, and formal training were all significant predictors of positive attitudes toward PC. This supports previous research indicating that personal values and exposure to death influence how nurses perceive and engage with end-of-life care [8, 43]. In addition, religious beliefs may also foster empathetic engagement and acceptance of mortality, while caregiving experience helps reduce anxiety and builds confidence [34, 44]. Importantly, the role of training is especially noteworthy, echoing findings by Achora and Labrague [15] who emphasized that education enhances nurses' emotional readiness and professional attitudes. Overall, these predictors reinforce the importance of reflective, value-based, and experiential components in training curricula.

5.4. *Predictors of Palliative Care Knowledge*

Nurses with prior experience in caring for dying patients and those who had received formal training in PC scored significantly higher in knowledge assessments. This pattern corroborates both local and international literature [35], confirming that hands-on experience and structured learning are central to developing palliative competencies. Interestingly, the findings echo earlier research by Fristedt, et al. [42] which showed that clinical exposure and continuing education are more influential than demographic factors like age or gender. However, this study also highlights that such opportunities remain limited in non-pilot cities like Xuzhou. These gaps must be addressed through investment in standardized and regionally accessible training programs for community nurses.

5.5. *Theoretical Framework Revisited*

This study's findings strongly align with the guiding theoretical models. Frommelt's Theory of Attitudes Toward Care of the Dying, which emphasizes that attitudes are shaped by personal belief systems and experience, both of which were found to be significant predictors in this study. Nurses with religious backgrounds or who had provided end-of-life care were more likely to exhibit positive attitudes, supporting the affective and experiential components of Frommelt's model. Meanwhile, the KTA Framework highlights the dynamic process of translating evidence into practice through education and contextual application. The observed influence of training on both knowledge and attitude validates this framework's emphasis on capacity-building interventions. These theoretical models offer a strong interpretive lens through which to understand and improve PC competencies in the community nursing sector.

6. Conclusion

This study examined the attitudes and knowledge levels of CHNs toward PC in Xuzhou, a non-pilot city in China. The findings reveal that while CHNs generally hold positive attitudes toward caring for terminally ill patients, their knowledge remains at a moderate level, with critical gaps in areas, such as opioid use and symptom management. Importantly, the study identified three consistent predictors across both domains: *prior experience in caring for dying patients*, *PC training*, and *religious beliefs*. These variables were significantly associated with more positive attitudes and higher knowledge scores, reinforcing the importance of both experiential and educational pathways in enhancing PC readiness. Theoretically, the results affirm Frommelt's emphasis on the affective and experiential bases of caregiving attitudes and align with the KTA framework's model of knowledge transfer through targeted training and practical engagement. In the context of expanding community-based PC in China, this study provides timely evidence that investing in structured, accessible training, especially for CHNs in non-pilot regions, is essential for improving the quality and equity of end-of-life services. Policymakers, nursing educators, and health administrators must collaborate to integrate PC content into continuing education programs, foster reflective practice, and support the personal growth of community nurses in end-of-life care delivery.

6.1. Recommendations and Implications for Practice

Given the moderate level of PC knowledge and the variability in attitudes observed among CHNs in Xuzhou, several actionable recommendations emerge:

- **Integrate PC into Continuing Education** - Local health authorities should collaborate with academic institutions to offer standardized, evidence-based training modules tailored for CHNs. These should emphasize communication skills, symptom management, and the ethical dimensions of end-of-life care.
- **Promote Experiential Learning Opportunities** - Hospice rotations, mentorship programs, or case-based simulations can provide CHNs with practical exposure to palliative scenarios, reinforcing both knowledge and emotional preparedness.
- **Incorporate Value-Based Reflection** - Training programs should include reflective practices that allow nurses to explore how personal beliefs, including religion or cultural perspectives, influence their care attitudes, building alignment with Frommelt's Attitude Theory.
- **Address Regional Inequities** - Special attention must be given to non-pilot cities like Xuzhou by decentralizing resources and expanding access to PC education in community settings, reducing urban-rural disparities in care quality.
- **Institutionalize Knowledge-to-Action Processes** - Guided by the KTA framework, health administrators should develop mechanisms to not only deliver knowledge, but also support its adaptation and use in practice, through peer support, policy integration, and feedback loops.

By addressing both cognitive and affective components of professional development, these strategies can strengthen CHNs' competencies in PC and ensure more equitable, compassionate support for patients nearing the end of life.

6.2. Limitations of the Study

This study has several limitations that should be acknowledged. First, its cross-sectional design captures associations at a single point in time, limiting the ability to draw causal inferences, particularly regarding the impact of training or experience on PC knowledge and attitudes. Second, the use of self-report questionnaires introduces the potential for social desirability bias, as participants may respond in ways they perceive as professionally acceptable rather than reflective of their true beliefs or knowledge. Third, the study was conducted in Xuzhou, a single non-pilot city, which may not represent the diversity of healthcare systems, training access, and cultural contexts across other Chinese regions. As such, generalizability to other geographic or institutional settings should be approached with caution.

Lastly, while validated tools (FATCOD-B and PCKT) were employed, the use of a limited set of influencing variables (e.g., excluding organizational or systemic factors) may overlook broader contextual influences on nurses' competencies. Future studies would benefit from longitudinal or mixed-methods designs, multi-site sampling, and the inclusion of organizational and policy-level determinants to provide a more holistic understanding of PC preparedness among CHNs.

Institutional Review Board Statement:

The study was conducted in accordance with the principles of the Declaration of Helsinki. The research protocol was reviewed and approved by the ethics review panel of the Graduate Program at the University of St. La Salle.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

Author Contributions:

Conceptualization, Z.Z., M.B.P.D., and S.M.T.; methodology, Z.Z., M.B.P.D., and S.M.T.; software, G.S.C.; validation, Z.Z., M.B.P.D., S.M.T., and G.S.C.; formal analysis, Z.Z.; investigation, Z.Z., M.B.P.D., S.M.T., and G.S.C.; resources, Z.Z., M.B.P.D., S.M.T., and G.S.C.; data curation, Z.Z.; writing—original draft preparation, Z.Z.; writing—review and editing, Z.Z., M.B.P.D., S.M.T., and G.S.C.; visualization, G.S.C.; supervision, M.B.P.D. and S.M.T.; project administration, Z.Z., M.B.P.D., and S.M.T.; funding acquisition, Z.Z., M.B.P.D., S.M.T., and G.S.C. All authors have read and agreed to the published version of the manuscript.

Acknowledgments:

The authors gratefully acknowledge the insightful comments and constructive suggestions provided by the reviewers, which significantly contributed to improving the clarity and rigor of this manuscript. We also extend our sincere thanks to all the community health nurses who generously participated in the survey and shared their valuable perspectives.

Copyright:

© 2025 by the authors. This open-access article is distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

References

- [1] J. Bao *et al.*, "Current state of care for the elderly in China in the context of an aging population," *BioScience Trends*, vol. 16, no. 2, pp. 107–118, 2022. <https://doi.org/10.5582/bst.2022.01068>
- [2] W. Wei *et al.*, "Cancer registration in China and its role in cancer prevention and control," *The Lancet Oncology*, vol. 21, no. 7, pp. e342 – e349, 2020. [https://doi.org/10.1016/S1470-2045\(20\)30073-5](https://doi.org/10.1016/S1470-2045(20)30073-5)
- [3] S. Hu, J. Wang, C. Cheng, and X. Wu, "Analysis of epidemiological trends in chronic diseases of Chinese residents," *Aging Medicine*, vol. 3, no. 4, pp. 226–233, 2020. <https://doi.org/10.1002/agm2.12134>
- [4] S. Tang, Y. Xu, Z. Li, T. Yang, and D. Qian, "Does economic support have an impact on the health status of elderly patients with chronic diseases in China? Based on CHARLS (2018) data research," *Frontiers in Public Health*, vol. 9, p. 658830, 2021. <https://doi.org/10.3389/fpubh.2021.658830>
- [5] W. Cao, H.-D. Chen, Y.-W. Yu, N. Li, and W.-Q. Chen, "Changing profiles of cancer burden worldwide and in China: A secondary analysis of the global cancer statistics 2020," *Chinese Medical Journal*, vol. 134, no. 7, pp. 783–791, 2021. <https://doi.org/10.1097/CM9.0000000000001474>
- [6] C. Xia *et al.*, "Cancer statistics in China and United States, 2022: Profiles, trends, and determinants," *Chinese Medical Journal*, vol. 135, no. 5, pp. 584–590, 2022. <https://doi.org/10.1097/CM9.0000000000002108>

- [7] A. Leng, E. Maitland, S. Wang, S. Nicholas, K. Lan, and J. Wang, "Preferences for end-of-life care among patients with terminal cancer in China," *JAMA Netw Open*, vol. 5, no. 4, p. e228788, 2022. <https://doi.org/10.1001/jamanetworkopen.2022.8788>
- [8] O.-J. B. Jimenez, S. M. Trajera, and G. S. Ching, "Providing end-of-life care to COVID-19 patients: The lived experiences of ICU nurses in the Philippines," *International Journal of Environmental Research and Public Health*, vol. 19, no. 19, p. 12953, 2022. <https://doi.org/10.3390/ijerph191912953>
- [9] N. Bradley, M. Lloyd-Williams, and C. Dowrick, "Effectiveness of palliative care interventions offering social support to people with life-limiting illness: A systematic review," *European Journal of Cancer Care*, vol. 27, p. e12837, 2018. <https://doi.org/10.1111/ecc.12837>
- [10] M. Akbarian-Rokni, M. Abbasi, S. Pezaro, and M. Mardani-Hamooleh, "Compassion as the cornerstone of palliative nursing care for patients with heart failure: A phenomenological study," *BMC Research Notes*, vol. 18, p. 81, 2025. <https://doi.org/10.1186/s13104-025-07158-7>
- [11] B. Trakoolngamden, S. Monkong, S. Chaiviboontham, P. Satitvipawee, and Y. Runglodvatana, "Effect of a peaceful end-of-life care program on perceived good death in people with advanced cancer and their family caregivers," *Journal of Hospice & Palliative Nursing*, vol. 27, no. 2, pp. 94-101, 2025. <https://doi.org/10.1097/NJH.0000000000001100>
- [12] R. Siva, V. Sadan, G. Alexander, S. Immanuel, and P. Joy, "Reflections on the experience of community health nurses in palliative care: A qualitative approach," *Indian Journal of Palliative Care*, vol. 27, no. 2, pp. 330-335, 2021. <https://doi.org/10.25259/IJPC.65.21>
- [13] J. Zhang, Y. Cao, M. Su, J. Cheng, and N. Yao, "Challenges faced by Chinese community nurses when providing home-based hospice and palliative care: A descriptive qualitative study," *BMC Palliative Care*, vol. 21, p. 14, 2022. <https://doi.org/10.1186/s12904-022-00905-8>
- [14] T. Wang, A. Molassiotis, B. P. M. Chung, and J.-Y. Tan, "Current research status of palliative care in mainland China," *Journal of Palliative Care*, vol. 33, no. 4, pp. 215-241, 2018. <https://doi.org/10.1177/0825859718773949>
- [15] S. Achora and L. J. Labrague, "An integrative review on knowledge and attitudes of nurses toward palliative care: Implications for practice," *Journal of Hospice & Palliative Nursing*, vol. 21, no. 1, pp. 29-37, 2019. <https://doi.org/10.1097/NJH.0000000000000481>
- [16] A. Soikkeli-Jalonen *et al.*, "Instruments for assessing nurses' palliative care knowledge and skills in specialised care setting: An integrative review," *Journal of Clinical Nursing*, vol. 29, no. 5-6, pp. 736-757, 2020. <https://doi.org/10.1111/jocn.15146>
- [17] Y. Lu, Y. Gu, and W. Yu, "Hospice and palliative care in China: Development and challenges," *Asia-Pacific Journal of Oncology Nursing*, vol. 5, no. 1, pp. 26-32, 2018. https://doi.org/10.4103/apjon.apjon_72_17
- [18] M. Gelkopf, Z. Roffe, P. Behrbalk, Y. Melamed, N. Werbloff, and A. Bleich, "Attitudes, opinions, behaviors, and emotions of the nursing staff toward patient restraint," *Issues in Mental Health Nursing*, vol. 30, no. 12, pp. 758-763, 2009. <https://doi.org/10.3109/01612840903159777>
- [19] J. V. Brooks, C. Poague, T. Formagini, C. T. Sinclair, and H. V. Nelson-Brantley, "The role of a symptom assessment tool in shaping patient-physician communication in palliative care," *Journal of Pain and Symptom Management*, vol. 59, no. 1, pp. 30-38, 2020. <https://doi.org/10.1016/j.jpainsymman.2019.08.024>
- [20] L. A. Cross and S. Abbeyquaye, "Preparing nurses for palliative care in long term care: An integrative review," *Journal of Professional Nursing*, vol. 53, pp. 131-139, 2024. <https://doi.org/10.1016/j.profnurs.2024.05.011>
- [21] K. H. M. Frommelt, "The effects of death education on nurses' attitudes toward caring for terminally ill persons and their families," *American Journal of Hospice and Palliative Medicine*, vol. 8, no. 5, pp. 37-43, 1991. <https://doi.org/10.1177/104990919100800509>
- [22] I. D. Graham and J. M. Tetroe, "The knowledge to action framework," in *Models and frameworks for implementing evidence-based practice: Linking evidence to action*, J. Rycroft-Malone and T. Bucknal Eds. Hoboken, NJ: Wiley, 2010, pp. 207-221.
- [23] Y. Nakazawa, M. Miyashita, T. Morita, M. Umeda, Y. Oyagi, and T. Ogasawara, "The palliative care knowledge test: Reliability and validity of an instrument to measure palliative care knowledge among health professionals," *Palliative Medicine*, vol. 23, no. 8, pp. 754-766, 2009. <https://doi.org/10.1177/0269216309106871>
- [24] J. Robinson, M. Gott, C. Gardiner, and C. Ingleton, "Specialist palliative care nursing and the philosophy of palliative care: A critical discussion," *International Journal of Palliative Nursing*, vol. 23, no. 7, pp. 352-358, 2017. <https://doi.org/10.12968/ijpn.2017.23.7.352>
- [25] D. E. Meier, "Increased access to palliative care and hospice services: Opportunities to improve value in health care," *The Milbank Quarterly*, vol. 89, no. 3, pp. 343-380, 2011. <https://doi.org/10.1111/j.1468-0009.2011.00632.x>
- [26] R. Taylor *et al.*, "A scoping review of initiatives to reduce inappropriate or non-beneficial hospital admissions and bed days in people nearing the end of their life: Much innovation, but limited supporting evidence," *BMC Palliative Care*, vol. 19, p. 24, 2020. <https://doi.org/10.1186/s12904-020-0526-2>
- [27] C. Centeno and J. Y. Rhee, "Organization of palliative care in different parts of the world," in *Textbook of Palliative Care*, R. D. MacLeod and L. Block Eds.: Springer, 2018, pp. 1-39.
- [28] A. P. Glass, L.-K. Chen, E. Hwang, Y. Ono, and L. Nahapetyan, "A cross-cultural comparison of hospice development in Japan, South Korea, and Taiwan," *Journal of Cross-Cultural Gerontology*, vol. 25, pp. 1-19, 2010. <https://doi.org/10.1007/s10823-009-9108-8>

- [29] A. H. Kamal, D. C. Currow, C. S. Ritchie, J. Bull, and A. P. Abernethy, "Community-based palliative care: The natural evolution for palliative care delivery in the U.S.," *Journal of Pain and Symptom Management*, vol. 46, no. 2, pp. 254–264, 2013. <https://doi.org/10.1016/j.jpainsymman.2012.07.018>
- [30] E. Vernon, M. C. Hughes, and M. Kowalczyk, "Measuring effectiveness in community-based palliative care programs: A systematic review," *Social Science & Medicine*, vol. 296, p. 114731, 2022. <https://doi.org/10.1016/j.socscimed.2022.114731>
- [31] F. Hasson, M. Betts, C. Shannon, and A. Fee, "Roles and responsibilities of the community palliative care key worker: A scoping review," *British Journal of Community Nursing*, vol. 27, no. 8, pp. 384–391, 2022. <https://doi.org/10.12968/bjcn.2022.27.8.384>
- [32] E. M. Van Heerden and L. S. Jenkins, "The role of community health workers in palliative care in a rural subdistrict in South Africa," *African Journal of Primary Health Care and Family Medicine*, vol. 14, no. 1, p. a3657, 2022. <https://doi.org/10.4102/phcfm.v14i1.3657>
- [33] J. V. Vitorino, B. V. Duarte, A. M. Ali, and C. Laranjeira, "Compassionate engagement of communities in support of palliative and end-of-life care: Challenges in post-pandemic era," *Frontiers in Medicine*, vol. 11, p. 1489299, 2024. <https://doi.org/10.3389/fmed.2024.1489299>
- [34] C. M. Puchalski, R. E. Dorff, and I. Y. Hendi, "Spirituality, religion, and healing in palliative care," *Clinics in Geriatric Medicine*, vol. 20, no. 4, pp. 689–714, 2004.
- [35] J. Dehghannezhad, H. Hassankhani, F. Taleghani, A. Rahmani, S. SattarPour, and Z. Sanaat, "Home care nurses' attitude towards and knowledge of home palliative care in Iran: A cross-sectional study," *Iranian Journal of Nursing and Midwifery Research*, vol. 26, no. 3, pp. 272–278, 2021. https://doi.org/10.4103/ijnmr.IJNMR_249_19
- [36] L. Chen *et al.*, "Nurses' knowledge, attitudes, and willingness to practice hospice care: An analysis of influencing factors," *PLoS One*, vol. 17, no. 2, p. e0259647, 2022. <https://doi.org/10.1371/journal.pone.0259647>
- [37] X. Li, W. Kongsuwan, and K. Yodchai, "Attitude toward care of the dying and practice of peaceful end-of-life care in community hospitals in China," *International Nursing Review*, vol. 70, no. 3, pp. 345–354, 2023. <https://doi.org/10.1111/inr.12812>
- [38] M. M. Ross, B. McDonald, and J. McGuinness, "The palliative care quiz for nursing (PCQN): The development of an instrument to measure nurses' knowledge of palliative care," *Journal of Advanced Nursing*, vol. 23, no. 1, pp. 126–137, 1996. <https://doi.org/10.1111/j.1365-2648.1996.tb03106.x>
- [39] C. Ramplin, "Establishing a structured plan to provide high-quality end-of-life care in community settings," *British Journal of Community Nursing*, vol. 24, no. 3, pp. 120–127, 2019. <https://doi.org/10.12968/bjcn.2019.24.3.120>
- [40] B. V. Danielsen, A. M. Sand, J. H. Rosland, and O. Førland, "Experiences and challenges of home care nurses and general practitioners in home-based palliative care: A qualitative study," *BMC Palliative Care*, vol. 17, p. 95, 2018. <https://doi.org/10.1186/s12904-018-0350-0>
- [41] H. Shi *et al.*, "Knowledge and attitudes toward end-of-life care among community health care providers and its influencing factors in China: A cross-sectional study," *Medicine*, vol. 98, no. 45, p. e17683, 2019. <https://doi.org/10.1097/MD.00000000000017683>
- [42] S. Fristedt, A. Grynne, C. Melin-Johansson, I. Henoch, C. L. Hagelin, and M. Browall, "Registered nurses and undergraduate nursing students' attitudes to performing end-of-life care," *Nurse Education Today*, vol. 98, p. 104772, 2021. <https://doi.org/10.1016/j.nedt.2021.104772>
- [43] H. Chung, R. Harding, and P. Guo, "Palliative care in the greater China region: A systematic review of needs, models, and outcomes," *Journal of Pain and Symptom Management*, vol. 61, no. 3, pp. 585–612, 2021. <https://doi.org/10.1016/j.jpainsymman.2020.08.040>
- [44] E. H. Kang, "Factors influencing nurses' attitudes toward terminal care," *Journal of Korean Critical Care Nursing*, vol. 13, no. 1, pp. 76–86, 2020. <https://doi.org/10.34250/jkccn.2020.13.1.76>
- [45] X. Teng, M. Tang, L. Jing, Y. Xu, and Z. Shu, "Healthcare provider knowledge, attitudes, and practices in hospice care and their influencing factors: A cross-sectional study in Shanghai," *International Journal of Health Policy and Management*, vol. 11, no. 12, p. 3090, 2022. <https://doi.org/10.34172/ijhpm.2022.6525>
- [46] Z. Ye *et al.*, "Attitudes and influencing factors of nursing assistants towards hospice and palliative care nursing in Chinese nursing homes: A cross-sectional study," *BMC Palliative Care*, vol. 22, no. 1, p. 49, 2023. <https://doi.org/10.1186/s12904-023-01175-8>
- [47] L. Cohen, L. Manion, and K. Morrison, *Research methods in education*. New York: Routledge, 2007.
- [48] K. A. Levin, "Study design III: Cross-sectional studies," *Evidence-Based Dentistry*, vol. 7, pp. 24–25, 2006. <https://doi.org/10.1038/sj.ebd.6400375>
- [49] W. A. Van der Stede, "A manipulationist view of causality in cross-sectional survey research," *Accounting, Organizations and Society*, vol. 39, no. 7, pp. 567–574, 2014. <https://doi.org/10.1016/j.aos.2013.12.001>
- [50] P. Charlton *et al.*, "Snapshot in time: A cross-sectional study exploring stakeholder experiences with environmental scans in health services delivery research," *BMJ Open*, vol. 14, p. e075374, 2024. <https://doi.org/10.1136/bmjopen-2023-075374>

- [51] R. Wang, T. Lu, C. Wan, X. Sun, and W. Jiang, "Measuring the effects of streetscape characteristics on perceived safety and aesthetic Appreciation of pedestrians," *Journal of Urban Planning and Development*, vol. 149, no. 3, p. 05023020, 2023. <https://doi.org/10.1061/JUPDDM.UPENG-4314>
- [52] L. Lin, F. Wu, W. Chen, C. Zhu, and T. Huang, "Research on urban medical and health services efficiency and its spatial correlation in China: Based on panel data of 13 cities in Jiangsu province," *Healthcare*, vol. 9, no. 9, p. 1167, 2021. <https://doi.org/10.3390/healthcare9091167>
- [53] P. Sedgwick, "Cluster sampling," *BMJ*, vol. 348, p. g1215, 2014. <https://doi.org/10.1136/bmj.g1215>
- [54] L.-P. Wang, Y.-J. Li, W.-Z. Yan, and G.-M. Li, "Development and psychometric testing Chinese version of the Frommelt Attitude Toward Care of the Dying Scale, form B in nurses and nursing students," *Journal of Cancer Education*, vol. 31, pp. 123-130, 2016. <https://doi.org/10.1007/s13187-015-0810-7>
- [55] R. Likert, "A technique for the measurement of attitudes," *Archives of Psychology*, vol. 22, no. 140, p. 55, 1932.
- [56] L. J. Cronbach, "Coefficient alpha and the internal structure of tests," *Psychometrika*, vol. 16, pp. 197-334, 1951. <https://doi.org/10.1007/BF02310555>
- [57] J. Fu, H. J. Lin, P. Ni, and J. Mao, "Anning liaohu zhishi ceping liangbiao de Hanhua he xindu, xiaodu jianyan [Chinese translation and reliability and validity testing of the Palliative Care Knowledge Test]," *Xiandai Linchuang Huli*, vol. 22, no. 2, pp. 46-51, 2023.