ORIGINAL RESEARCH

Knowledge, Attitude, and Practice of Palliative Care Among Physicians and Nurses in Intensive Care Units in Shanghai, China

Xinhe He[1,2,*], Hengzhe Cai[3,*], Jingying Zhang[4,*], Wei Chen[1], Biao Zhu [iD][1]

[1]Department of Anaesthesia, Critical Care and Pain Medicine, Fudan University Shanghai Cancer Center, Shanghai, 200032, People's Republic of China; [2]Department of Oncology, Shanghai Medical College, Fudan University, Shanghai, 200032, People's Republic of China; [3]High School Affiliated to Fudan University, Shanghai, 200433, People's Republic of China; [4]Nursing Department, Fudan University Shanghai Cancer Center, Shanghai, 200032, People's Republic of China

*These authors contributed equally to this work

Correspondence: Biao Zhu; Wei Chen, Department of Anaesthesia, Critical Care and Pain Medicine, Fudan University Shanghai Cancer Center, No. 270, Dongan Road, Shanghai, 200032, People's Republic of China, Tel +86-13681971629, Email zhubiaozs@126.com; chenwei_fdu@fudan.edu.cn

Purpose: The growing need for palliative care in China's aging population highlights the intensive care unit (ICU) staff's crucial role and need for specialized training and improved knowledge, attitude, and practice (KAP). The study aims to assess the KAP of palliative care ICU physicians and nurses and identify influencing factors.

Patients and Methods: A cross-sectional survey was conducted among ICU physicians and nurses at three Shanghai hospitals. A self-developed structured online questionnaire was used to collect participant characteristics and KAP data related to palliative care. Pathway analysis explored associations among knowledge, attitude, and practice.

Results: Among 203 participants, median scores for knowledge, attitude, and practice were 8/18, 39/50, and 35/45, respectively. Multivariable analysis revealed that 10–15 years (OR=0.06) and >15 years (OR=0.19) of experience in the ICU and the lack of palliative care experience (OR=0.29) were associated with poor knowledge. Positive attitudes (OR=1.22) and palliative care training (OR=3.25) were associated with proactive practice. Knowledge directly impacted attitude (β=0.260; P=0.012) and practice (β=0.320, P<0.001), while attitude directly influenced practice (β=0.278, P<0.001).

Conclusion: The study reveals a low KAP level of palliative care among ICU physicians and nurses in Shanghai. Pathway analysis underscores the crucial role of knowledge in shaping attitudes and practices, emphasizing the urgency of improving knowledge and attitudes toward palliative care among physicians and nurses.

Keywords: palliative care, intensive care unit, physicians, nurses, knowledge, attitude, practice

Introduction

Palliative care provides noncurative treatment for those diagnosed with a terminal illness (typically defined as the final 6 months), focusing on comfort care, as well as practical and emotional support for people at the end of life and their family members.[1] In China, the proportion of people >65 years of age is expected to reach 39% by 2050, gradually becoming one of the world's largest populations to seek palliative care for chronic debilitating conditions and cancer.[2,3] Starting with the foundation of the Committee of Rehabilitation and Palliative Care (CRPC) in 1994, China strives to strengthen and develop palliative care.[4] Although guidelines for palliative care in China were published in 2017, the knowledge of the core principles of palliative care is still limited among healthcare providers and the general population.[5,6]

The emergency department and the Intensive Care Unit (ICU) often serve as an inflection point, signaling a more rapid decline in health.[7] Admissions to the ICU often serve as an inflection point to encourage patients to consider future medical care decisions, discuss goals of care, and/or document advance directives.[7,8] Therefore, ICU personnel require knowledge and competence in many aspects related to palliative care or palliative care. It was previously shown that

educational programs are essential for healthcare workers who provide decision-making support in palliative care. These programs help healthcare workers develop the skills and knowledge needed to provide compassionate and effective care by improving patient care, enhancing professional skills, and supporting families.[9,10]

The knowledge, attitude, and practice (KAP) concept is a quantitative research methodology that might help to access misconceptions or misunderstandings regarding a specific question in a given population of individuals.[11] Three studies in nurses showed poor KAP toward palliative care.[12–14] It was previously shown that the KAP of healthcare workers toward palliative care would affect the quality of palliative care received by the patient.[15,16]

There is little known about the quality of palliative care in the ICUs in China/Shanghai. In attempting to assess the quality, this study examined the KAP toward palliative care among healthcare physicians and nurses in ICUs, investigated the demographic and professional factors, and found that the KAP needs improvement.

Material and Methods

Study Design and Participants

This cross-sectional study survey was conducted October 21–24, 2023, in the healthcare providers of the ICUs of three tertiary hospitals in Shanghai, China. All physicians and nurses working for at least 1 year in the ICU of these three hospitals were approached for participation in the study. The workers on leave (irrespective of the reasons) were excluded. All participants provided informed consent.

Questionnaire introduction

The questionnaire was designed by the investigators based on previous studies.[12,17] Each item was discussed by a committee composed of investigators from all three hospitals to ensure content validity. After completing the questionnaire, 40 healthcare providers participated in the pilot. The Cronbach's α was 0.796. The pilot participants were requested to identify any unclear or confusing item to ensure face value.

The final questionnaire was in Chinese (a version translated into English was attached as Table S1; the original questionnaire was in Chinese, and the English translation is only provided for indicative purposes since the translation was not validated) and contained four dimensions: demographic information (gender, age, education, religion, occupation type, title, years of ICU work, type of hospital, palliative care training, and experience), knowledge dimension, attitude dimension, and willingness/practice dimension. The titles were categorized as none, junior, physician/nurse-in-charge, assistant chief, and chief, according to the Chinese medical hierarchy system.[18] The knowledge dimension consisted of 15 questions scored with a 3- or 2-point Likert scale, with 2 points for knowledge, 1 point for partial knowledge, and 0 points for no knowledge or 1 point for correct answers and 0 points for unclear/incorrect answers, with a range of 0–18 points. The attitude dimension consisted of 10 questions using a 5-point Likert scale. The positive attitude questions (questions 1, 2, 4, 7, 8, 9, and 10) were forward-assigned a score of 5–1 from strongly agree to strongly disagree; the negative attitude questions (questions 3, 5, and 6) were reversely-assigned a score ranging from 1 to 5; the score ranged from 10 to 50. The willingness/practice dimension contained nine questions also using a 5-point Likert scale, ranging from strongly agree/always (5 points) to strongly disagree/never (1 point), reversely assigned with scores ranging from 9–45 points.

Questionnaire Star (Changsha Ranxing Information Technology Co., Ltd)., a professional online questionnaire software platform, was used to design and create a link to the questionnaire. The online questionnaires were disseminated through the WeChat ICU physicians' and nurses' groups, and the data was collected via Questionnaire Star. The participants independently decided whether to participate in the questionnaire survey. The questionnaire was required to be completed within 3 days.

In order to ensure the quality and completeness of the results, each IP address could be used for submission only once, and all items had to be completed for submission. An Excel spreadsheet was exported from the Questionnaire Star platform. All questionnaires were checked for completeness, consistency, and validity by the members of the research team. All questionnaires were completed anonymously. Only the IP address was retained to ensure no duplicate questionnaires were submitted, but they were destroyed once the data collection process was completed and validated.

Sample Size Calculation

The sample size was calculated as five times the number of items (n=34) in the KAP questionnaire. Considering that 10% of the questionnaires would be invalid, a minimum of 187 participants was required.

Statistical Analysis

Statistical analysis was performed using Stata 14.0 (Stata Corporation, College Station, TX, USA) and R 4.3.1. Continuous variables were tested for normal distribution using the Kolmogorov–Smirnov test. If conforming to the normal distribution, they were expressed as means ± standard deviations (SD) and compared between two groups using Student's *t*-test. If not conforming to the normal distribution, they were expressed as medians (ranges) and compared between two groups using the Mann–Whitney *U*-test. Continuous variables among three or more groups were compared using ANOVA (a normal distribution with equal variance) or the Kruskal–Wallis test (non-normal distribution or unequal variance). Correlations were tested using Spearman's test. Categorical variables were expressed as n (%). Knowledge, attitudes, and practices were categorized according to the 70% scores; scores ≥70% were considered good knowledge, positive attitudes, and proactive practices. The independent influencing demographic and professional factors were explored using multivariable logistic regression. The variables with P<0.20 in the univariable analyses were included in the multivariable analysis. Pathway analysis was used to test the following six hypotheses: 1) knowledge has a direct impact on attitude, 2) attitude has a direct impact on practice, and 3) knowledge has a direct impact on practice. Two-sided P-values <0.05 were considered statistically significant.

Results

Characteristics of the Participants

A total of 243 questionnaires were collected, of which 30 were excluded due to incomplete data. Ultimately, 203 valid questionnaires were included in the analysis, with a validity rate of 83.54%. Their median age was 33 (range, 20–54) years, and 142 (70.0%) were female. The majority of the participants had a bachelor's degree (59.1%), were nurses (56.7%), had primary professional qualifications (43.8%), had been working for <5 years (38.42%), were working in general public hospitals (86.2%), were involved in integrated ICUs (76.9%), had no special training in palliative care (80.8%), had no religious beliefs (93.6%), and had no specific experience in palliative care (51.7%) (Table 1).

KAP of Palliative Care

The median knowledge, attitude, and practice scores were 10 (range, 0–16) out of 18, 39 (range, 30–50) out of 50, and 35 (range, 17–45) out of 45, respectively. Education (P=0.007), training in palliative care (P<0.001), and experience in palliative care (P<0.001) were associated with the knowledge scores. Gender (P=0.044), occupation (P=0.009), professional qualifications (P=0.019), and experience in palliative care (P=0.003) influenced the attitude scores. Training in palliative care (P<0.001) and experience in palliative care (P<0.001) were associated with the practice scores (P<0.001) (Table 1).

Most participants were at least partially familiar with the core principles of palliative care. A high knowledge was observed regarding K10 (84.24%), while poor knowledge was observed for K6 (10.34%) (Table 2). There were no differences in attitude item scores between physicians and nurses (all P>0.05), except for items A6 (P=0.002) and A9 (P=0.047) (Table 2). There were no differences between physicians and nurses in the practice item scores (all P>0.05), except for item P4 (P=0.025), with scores higher for physicians than nurses (Table 2).

The knowledge scores correlated with the attitude (r=0.26, P<0.001) and practice (r=0.36, P<0.001) scores. The attitude scores correlated with the practice scores (r=0.39, P<0.001) (Table 3).

Table 1 Comparison of the KAP Scores According to the Characteristics of the Participants

Variables		Knowledge		Attitude		Practice	
		Score	P	Score	P	Score	P
Total	203 (100)	10 (0,16)	–	39 (30, 50)	–	35 (17, 45)	–
Age: median (range)	33 (20, 54)	–	–	–	–	–	–
Gender			0.769		0.044		0.531
Male	61 (30.05)	10 (1,16)		40 (32, 49)		35 (17, 45)	
Female	142 (69.95)	9 (0,15)		38 (30, 50)		34.50 (22, 45)	
Education			0.007		0.074		0.543
Secondary technical / Junior college student	30 (14.78)	7 (0,14)		38 (30, 45)		33.50 (22, 45)	
Bachelor's degree	120 (59.11)	10 (1,15)		39 (30, 50)		35 (17, 45)	
Master's degree or above	53 (26.11)	10 (3,16)		39 (32, 49)		35 (20, 45)	
Occupation			0.061		0.009		0.118
Physician	88 (43.35)	10 (1,16)		39.43 ± 3.46		35.70 ± 5.35	
Nurse	115 (56.65)	9 (0,15)		38 (30, 50)		34 (17, 45)	
Professional qualification			0.11		0.019		0.491
None	11 (5.42)	9 (2,12)		37 (30, 40)		36 (27, 45)	
Junior	89 (43.84)	9 (0,15)		38 (30, 47)		34 (17, 45)	
Physician/nurse-in-charge	78 (38.42)	10 (1,16)		39 (32, 50)		35 (20, 45)	
Assistant chief or chief	25 (12.32)	10 (3,15)		41 (35, 49)		36 (24, 45)	
Years of working in the ICU			0.821		0.347		0.636
≤5 years	78 (38.42)	10 (1,15)		38.50 (30, 50)		35 (17, 45)	
5–10 years	56 (27.59)	9 (0,16)		38.82 ± 3.58		35.57 ± 5.49	
10–15 years	40 (19.70)	10 (1,13)		37.90 ± 3.58		34.13 ± 5.51	
≥15 years	29 (14.29)	9 (1,15)		39.55 ± 3.18		35.28 ± 4.90	
Type of hospital			0.288		0.434		0.070
Public general hospital	175 (86.21)	10 (0,16)		39 (30, 50)		35 (17, 45)	
Public cancer treatment center	28 (13.79)	10.5 (1,14)		39 (32, 45)		36 (25, 45)	
Type of ICU			0.726		0.899		0.819
Integrated ICU	156 (76.85)	10 (0,15)		38 (30, 49)		35 (17, 45)	
Special ICU	47 (23.15)	9 (1,16)		39 (30, 50)		34 (24, 45)	
Have any training related to palliative care			<0.001		0.936		<0.001
Yes	39 (19.21)	11 (6,16)		38 (30, 46)		38 (27, 45)	
No	164 (80.79)	9 (0,15)		39 (30, 50)		34 (17, 45)	
Religious beliefs			0.463		0.233		0.400
Yes	13 (6.40)	10 (4,14)		37 (31, 45)		36 (32, 44)	
No	190 (93.60)	10 (0,16)		39 (30, 50)		34.50 (17, 45)	
Have any work experiences in working in a palliative care department?			<0.001		0.003		<0.001
Yes	98 (48.28)	11 (1,16)	0.769	40 (30, 50)		36 (27, 45)	
No	105 (51.72)	9 (0,15)		38 (30, 45)		33 (17, 45)	

Notes: "-" means none or not applicable.
Abbreviation: ICU, intensive care unit.

Pathway Analysis

Table 4 presents the results of the pathway for the association among knowledge, attitude, and practice. Knowledge had a direct impact on attitude (β=0.260; P=0.012) and practice (β=0.320, P<0.001). Attitude had a direct influence on practice (β=0.278, P<0.001).

Factors Influencing the Knowledge, Attitude, and Practice

The multivariable analysis showed that 10–15 years (OR=0.06, 95% CI: 0.01–0.35, P=0.002) and >15 years (OR=0.19, 95% CI: 0.04–0.93, P=0.041) of experience and having no experience in palliative care (OR=0.29, 95% CI: 0.12–0.70,

Table 2 Knowledge, Attitude and Practice Dimension

Knowledge	Familiar	Partially Familiar	Unfamiliar
K1. Palliative care refers to comprehensive care provided to patients with limited life expectancy (6 months or less), either in a medical facility or at home. This care includes medical and psychological support to ensure patients achieve the best possible quality of life during their remaining time. Are you familiar with this concept?	70 (34.48)	118 (58.13)	15 (7.39)
K2. The core essence of palliative care is to reduce patient suffering, enhance comfort, improve quality of life, uphold patient dignity, and enable peaceful and regret-free end-of-life experiences within a limited time frame. Are you acquainted with this principle?	81 (39.9)	107 (52.71)	15 (7.39)
K3. In palliative care, the term "End of Life" (EoL) is commonly used. According to the European Society for Medical Oncology (ESMO) Clinical Practice Guidelines (CPG), EoL care refers to the care provided to individuals with advanced diseases once they reach a point of rapid physical decline, typically in the last few weeks or months before the inevitable natural outcome of death. Are you aware of this definition?	43 (21.18)	125 (61.58)	35 (17.24)
	Correct	**Wrong**	**Unclear**
K4. Palliative care is applicable only when there are signs of declining health or worsening conditions.	51 (25.12)	107 (52.71)	45 (22.17)
K5. The concept of palliative care is compatible with the principles of active treatment.	134 (66.01)	32 (15.76)	37 (18.23)
K6. Family members are not required to stay at the bedside until the moment of death occurs.	21 (10.34)	140 (68.97)	42 (20.69)
K7. Men usually resolve grief more quickly than women.	61 (30.05)	82 (40.39)	60 (29.56)
K8. Morphine is used as a standard for comparing the analgesic effects of other opioids.	92 (45.32)	62 (30.54)	49 (24.14)
K9. The severity of the disease determines the approach to pain management.	117 (57.64)	62 (30.54)	24 (11.82)
K10. Complementary therapies (such as massage, acupuncture, and listening to music) are important for pain control.	171 (84.24)	10 (4.93)	22 (10.84)
K11. In the final days of life, somnolence associated with electrolyte imbalances may reduce the need for sedatives.	116 (57.14)	36 (17.73)	51 (25.12)
K12. Long-term use of morphine for pain management poses a significant risk of drug addiction.	164 (80.79)	27 (13.3)	12 (5.91)
K13. Medications that can cause respiratory depression are appropriate for treating severe respiratory distress in the late stages of illness.	73 (35.96)	85 (41.87)	45 (22.17)
K14. Placebo use is applicable for treating certain types of pain.	163 (80.3)	13 (6.4)	27 (13.3)
K15. High doses of codeine cause more nausea and vomiting compared to morphine.	127 (62.56)	12 (5.91)	64 (31.53)
Attitude	**Physicians (n=88)**	**Nurses (n=115)**	**P**
A1. I believe that effective communication between patients, families, and healthcare staff is very important for palliative care.	5 (4, 5)	5 (3, 5)	0.192
A2. The whole process of palliative care should be understood by the patients and families.	5 (3, 5)	5 (2, 5)	0.274
A3. I am afraid of making friends with advanced cancer patients.	4 (1, 5)	4 (1, 5)	0.531
A4. I believe that families should be involved in the palliative care of advanced cancer patients.	5 (2, 5)	5 (1, 5)	0.439
A5. I believe that it is difficult to build a close relationship with the family of an advanced cancer patient.	3 (1, 5)	3 (1, 5)	0.195
A6. I am afraid of talking to the family of an advanced cancer patient about palliative care.	4 (1, 5)	3 (1, 5)	0.002
A7. I believe that it is better not to talk to patients about death directly.	2.93±1.10	3.06±1.05	0.396
A8. I believe that all advanced cancer patients should access palliative care.	4 (2, 5)	4 (1, 5)	0.111
A9. I believe that palliative care will reduce the pain of advanced cancer patients to a certain extent.	4 (3, 5)	4 (1, 5)	0.047
A10. I believe that chemotherapy and immunotherapy should not be used in the last few weeks of the patient's life.	4 (1, 5)	4 (2, 5)	0.880

(*Continued*)

Table 2 (Continued).

Practice	Physicians (n=88)	Nurses (n=115)	P
P1. I am willing to attend palliative care training.	4 (2, 5)	4 (2, 5)	0.129
P2. I am willing to preach the knowledge about palliative care to the families of cancer patients	4 (2, 5)	4 (1, 5)	0.164
P3. I am willing to take the initiative to learn about palliative care.	3 (1, 5)	3 (1, 5)	0.309
P4. I will preach the knowledge about end-of-life care among relatives and friends.	3 (1, 5)	3 (1, 5)	0.025
P5. How often do you practice the following work content of palliative care			
Applying assessment tools to assess the needs of patients	3 (1, 5)	3 (1, 5)	0.346
Control the pain of patients effectively	4 (2, 5)	4 (2, 5)	0.055
Ensure the sleep quality of patients.	4 (2, 5)	4 (2, 5)	0.553
Comfort the patients as much as possible	4 (3, 5)	4 (2, 5)	0.401
Provide psychological support	4 (2, 5)	4 (2, 5)	0.321

Notes: The original questionnaire was in Chinese, and the English translation is only provided for indicative purposes.

Table 3 Correlations in Knowledge, Attitude, and Practice Scores

	Knowledge	Attitudes	Practice
Knowledge	1		
Attitudes	0.26 (P<0.001)	1	
Practice	0.36 (P<0.001)	0.39 (P<0.001)	1

Table 4 Results of Pathway Among Knowledge, Attitude, and Practice

		β	P
Attitude	<-Knowledge	0.260	0.012
Practice	<-Attitude	0.278	<0.001
Practice	<-Knowledge	0.320	<0.001

P=0.006) were independently associated with good knowledge (Figure 1A). No factors were independently associated with a positive attitude (all P>0.05) (Figure 1B). The attitude scores (OR=1.22, 95% CI: 1.10–1.35, P=0.001) and training in palliative care (OR=3.25, 95% CI: 1.39–7.56, P=0.006) were independently associated with proactive practice (>38) (Figure 1C).
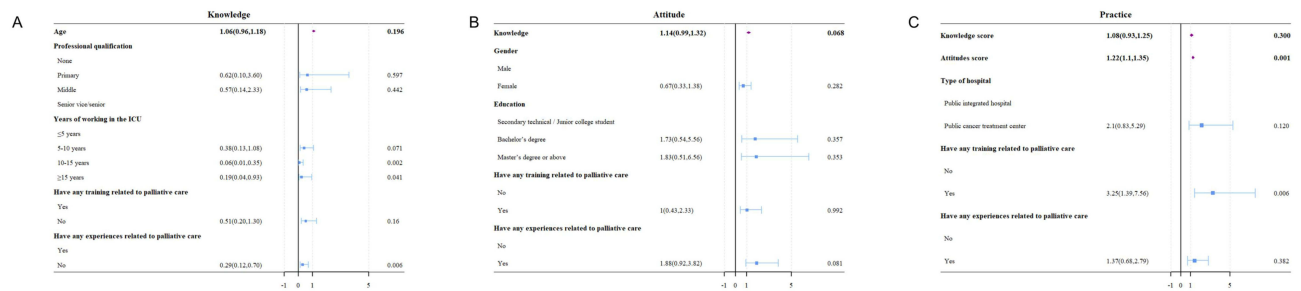

Figure 1 Multivariable analysis of the factors influencing the knowledge (**A**), attitude (**B**), and practice (**C**).
Abbreviations: OR, odds ratio; CI, confidence interval.

Discussion

This study found that ICU personnel in the Shanghai area had low knowledge, neutral attitudes, and poor practice toward palliative care.

In this study, the KAP scores of ICU physicians and nurses were relatively low, in line with the previous studies conducted among nurses in general wards and ICUs.[12–14] Kim et al[12] showed that South Korean nurses caring for non-cancer patients had low knowledge and moderate attitudes toward palliative care. Another study from South Korea reported poor knowledge of nurses toward end-of-life care.[13] Sato et al[14] reported that the KAP of Japanese nurses caring for cancer patients toward palliative care was poor. In China, attitudes of medical personnel towards palliative care have become slightly better in recent years,[19–21] as compared with studies conducted 10 or more years ago,[22,23] most likely due to the introduction of the "Practice Guidelines for Palliative Care" in 2017. Nevertheless, knowledge and practice still need improvement, as was discussed in the study by Chen et al[17] conducted in 2022 in the Guangxi region, which revealed very low knowledge and practice scores among nurses working in tertiary and secondary hospitals. It is partly explained by the fact that despite the open governmental policy and legislation support, palliative care services in China are still hindered by local policies; low public awareness, nurse shortage, and other barriers might also play a notable role.[6,24,25]

This study uncovered that the two main factors independently influencing the practice scores among physicians and nurses in Shanghai were attitude scores and training in palliative care. The pathway analysis showed the direct positive influence of attitude scores and palliative care training on practice. Regarding the attitude, it was one of the few studies that evaluated not only nurses but ICU physicians as well and found that physicians more often expressed beliefs that palliative care would reduce the pain of advanced cancer patients, while nurses were more afraid to talk to cancer patients. In the ICU setting, the nurse often has more contact with the family members than the doctor, placing an additional burden on the nurses.[26] Palliative care for patients in the ICU is often complex as well as emotionally draining, and complications such as possible polypharmacy, low patient/family acceptance of their condition, and poor attention given to the quality of life are harder to deal with in the ICU.[27–29] Conversely, the present study identified a shorter ICU experience as being independently associated with better knowledge; it is possible that the compassion fatigue of nurses could play a role.[27,30] Nevertheless, changing the attitude is complex, and placing the burden of decision-making aid on ICU nurses alone should be avoided. Indeed, although physicians and nurses are a team with complementary roles, the physicians are the ones making medical decisions regarding patient management and, therefore, can significantly promote quality palliative care.

Regarding the second point, pathway analysis confirmed that knowledge directly influenced both attitude and practice scores, highlighting the need to strengthen knowledge and training on palliative care among ICU physicians and nurses. Hence, physicians and nurses in Shanghai would benefit from attending specific training programs on palliative care in order to improve their practical skills and promote the implementation of decision-making aids in the ICU.

This study had some limitations. The study was performed in only three hospitals in the Shanghai area. The KAP of a specific population is influenced by local policies, laws, customs, and habits. KAP surveys are snapshots representing a specific population from a specific area and at a precise time, limiting the generalizability of the results. There is a possibility of the acquiescence bias (ie, the tendency of a respondent to agree with a statement when in doubt), which might have affected all three knowledge, attitude, and practice dimensions.[31] Although the study was adequately powered, the sample size was too small to allow for subgroup analyses. Future studies should be performed at a national scale and could be performed before and after the implementation of a training program.

Conclusion

In conclusion, the KAP of palliative care among ICU healthcare providers in the Shanghai area was low. The attitude scores and training in palliative care were independently associated with the proactive practice. Training in palliative care should be provided to ICU healthcare providers.

Data Sharing Statement

All data generated or analyzed during this study are included in this article.

Ethics Approval and Consent to Participate

This research was conducted in accordance with the ethical principles laid out by the Declaration of Helsinki (2000), as adapted for local regulations. The surveys were healthcare workers-directed, the data were anonymized, and ethical review board approval was exempted. All participants provided informed consent, ensuring their voluntary participation and privacy were respected throughout the study.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis, and interpretation, or in all these areas; took part in drafting, revising, or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Disclosure

The authors declare that they have no competing interests.

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