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Palliative care knowledge and self-efficacy: a comparative study between intensive care units and general units nurses

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Abstract

Background and objectives The growing number of terminally ill patients has underscored the importance of equipping healthcare workers with adequate palliative care knowledge and self-efficacy. This study aimed to compare the palliative care knowledge and self-efficacy of nurses in intensive care units (ICUs) with those in general wards at hospitals affiliated with Kerman University of Medical Sciences in 2023.

Methods This descriptive-comparative cross-sectional study involved nurses from intensive care units and general wards of three hospitals affiliated with Kerman University of Medical Sciences, for a total sample size of 300 nurses (150 in each group). The samples were selected using convenience sampling. The data collection tools included a demographic information questionnaire, the Palliative Care Knowledge Test (PCKT), and the Palliative Care Self-Efficacy Scale (PCSES). Convenience Sampling method was used. The data were analyzed using SPSS 23. Descriptive statistics (frequency, percentage, mean, and standard deviation) and inferential statistics (independent t-test, Mann-Whitney U test and multivariate stepwise regression) were employed. Statistical significance was determined by a p-value of ≤ 0.05 .

Findings The mean score for palliative care knowledge was 10.59 (± 2.10) for nurses in intensive care units and 10.43 (± 2.33) for nurses in general wards, with no significant difference between the two groups ($P=0.53$). Similarly, the mean score for palliative care self-efficacy was 28.01 (± 10.29) for nurses in intensive care units and 27.98 (± 10.33) for nurses in general wards, with no significant difference between the groups ($P=0.98$). Variables such as the history of caring for dying patients in the hospital ($P=0.004$) or at home ($P=0.01$), workplace ($P=0.002$), and work experience ($P=0.03$) were identified as the main predictors of palliative care knowledge and palliative care self-efficacy was affected by age ($P<0.001$), history of participation in palliative care training courses ($P=0.008$), and palliative care knowledge score ($P=0.01$).

Discussion and conclusion This study revealed no significant difference in total scores of palliative care knowledge or self-efficacy between nurses in intensive care units and general wards. It is suggested that more efforts be made to

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increase the knowledge and self-efficacy of all nurses, especially nurses in ICU departments, till providing a standard palliative care setting.

Keywords Knowledge, Self-efficacy, Palliative care, Nurses, Palliative care self-efficacy, Intensive care units

Introduction

The World Health Organization (WHO) defines palliative care as a patient-centered and family-centered approach aimed at enhancing the quality of life for individuals with life-threatening diseases through the prevention and alleviation of suffering [1, 2]. It is estimated that 37.4% of all deaths necessitate palliative care, with 80% of the global demand for palliative care services originating from middle-income countries [3].

As integral members of the palliative care team, nurses play a crucial role in achieving care goals, making their productivity essential [4]. Their performance significantly influences the quality of care, as they are expected to deliver professional services aligned with their competencies to ensure patient care quality, safety, and satisfaction [5]. To improve end-of-life care, it is essential to understand professionals' perceptions of coping with death, their attitudes towards the use of research, and the characteristics of their work environment [6].

Nurses' work environment is one of the greatest influences on the quality of care provided to patients and has a major impact on nurses' well-being [7]. Working in an understaffed environment, rotating shifts, and high workloads can contribute to missed care [8]. Aiken et al. (2012) identified a relationship between the work environment and care outcomes [9]. The environment can significantly affect end-of-life care. Therefore, understanding whether these factors are related to nurses' perceptions when dealing with dying patients could be crucial in promoting high-quality end-of-life care [10].

On the other hand, Nurses' competence in providing palliative care is crucial for ensuring high-quality care, influenced by their knowledge and attitudes toward palliative care and death [11]. Palliative care knowledge, defined as the essential understanding of palliative and end-of-life care necessary for providing quality care, is pivotal. Nurses' lack of knowledge and negative attitudes toward palliative care, as highlighted by Werku Etafa et al. (2020), present significant barriers to delivering quality palliative care. Effective delivery of palliative care services depends on the collective influence of healthcare providers' knowledge, attitudes, beliefs, and experiences [1].

Nurses with negative perceptions are likely to possess inadequate palliative care knowledge and may benefit from continuous education to effectively address the challenges associated with caring for end-of-life patients. Managers must foster a positive shift in nurses' attitudes to enhance their competence in delivering this

form of care [12]. A mixed systematic review (2020) assessed nurses' knowledge, attitudes, and beliefs about end-of-life care in nonspecialized palliative care centers and revealed that while palliative care services are being developed or have not been fully established in most countries worldwide, a significant portion of end-of-life care is provided in nonspecialized palliative care settings. The review also highlighted nurses' lack of knowledge about the psychosocial and spiritual aspects of end-of-life care [13]. A 2019 cross-sectional study in the Wollega region found insufficient palliative care knowledge and less favorable attitudes toward end-of-life care among nurses [1]. Zhou Yinghua et al.'s (2021) study in China revealed limited palliative care availability and a shortage of trained healthcare providers, leading to low knowledge levels among nursing students, hindering palliative care development [14]. Iranmanesh et al. (2014) and Farmani et al. (2019) reported nurses generally lacking palliative care knowledge due to education, experience, and cultural/professional limitations [15, 16]. Ke Ying-Xuan (2019) emphasized nurses' common obstacle of insufficient knowledge and skills in providing quality palliative care despite positive attitudes [17]. In Indonesia, a quantitative study analyzing the relationship between nurses' knowledge and self-confidence in applying palliative care in an ICU found high self-confidence but a lack of knowledge [18]. Medical and surgical ward staff inadequately address terminally ill patients' needs, highlighting the ongoing necessity for enhanced end-of-life care, especially within general wards [19].

Self-efficacy is a crucial determinant in palliative care [14]. Palliative care self-efficacy pertains to an individual's perceived capability to carry out tasks related to end-of-life care and encompasses two dimensions. The first dimension involves the perceived ability to address concerns related to end-of-life care (such as feeling confident in discussing questions about the dying process), while the second dimension involves the perceived ability to manage end-of-life symptoms in patients (feeling confident in responding to and addressing reports of pain, delirium, and terminal shortness of breath) [20]. A study by Zengin et al. (2014) suggested that nurses play a pivotal role in providing end-of-life care and that nurses' self-efficacy is a key factor influencing the quality of palliative care. High self-efficacy enhances the quality of care and ultimately improves individual and organizational performance [21]. Nurses with higher self-efficacy demonstrate greater dedication to their work and are more resilient in the face of challenges. In a study by

Kim (2020), nurses reported having limited palliative care knowledge and self-efficacy, and it was found that nurses' knowledge of palliative care is one of the strongest factors influencing their self-efficacy. Nurses who participated in palliative care training and those who had experienced the death of a family member or friend reported higher self-efficacy than did their peers. Understanding the factors that influence palliative care self-efficacy among nurses, as well as assessing nurses' knowledge, attitudes, and self-efficacy toward end-of-life care, are essential for providing high-quality end-of-life care to terminally ill patients [2].

Self-efficacy, a crucial factor in palliative care, involves perceived capabilities in addressing end-of-life concerns and managing symptoms. Zengin et al. (2014) highlighted nurses' critical role in end-of-life care, emphasizing that higher self-efficacy enhances care quality and organizational performance [21]. Kim's (2020) study identified limited palliative care knowledge and self-efficacy among nurses, with training and personal experiences influencing higher self-efficacy. Understanding these factors is vital for delivering quality end-of-life care to terminally ill patients [2]. Zhou (2021) found nursing students exhibited low palliative care self-efficacy [14]. In general, according to the studies conducted in Iran, the levels of knowledge regarding palliative care in Iran are poor, low to moderate [15, 16, 22, 23]. Regarding the self-efficacy of palliative care, it has been poor and low [24].

Overall, it is clear that nurses play a central role in providing high quality palliative care, especially at the end of life. Nurses' knowledge and self-efficacy are important factors that directly affect the quality of care provided to terminally ill patients [1, 14]. However, despite the critical nature of nurse engagement and the importance of the role of knowledge and self-efficacy, previous research has highlighted gaps in knowledge and self-efficacy in different areas and settings of care [13, 14], suggesting that these gaps may hinder the provision of optimal end-of-life care. On the other hand, according to the researchers' knowledge, no attention has been paid to the comparison of these characteristics between ICU nurses and those working in general palliative care units. ICU nurses, due to the stressful environment and frequency of exposure to end-of-life scenarios [25], may have unique challenges and opportunities that can affect their knowledge and confidence in providing palliative care. In contrast, nurses in general care units may not encounter such frequent or intense experiences, potentially leading to different levels of knowledge and self-efficacy. Since the work environment can affect the abilities and quality of care provided by nurses [26], understanding these differences is critical because they can inform targeted interventions such as appropriate educational programs to enhance palliative care in different clinical settings. Therefore, this study

seeks to fill an important knowledge gap by investigating whether the experiences of ICU nurses in terms of palliative care knowledge and self-efficacy differ significantly from those of general nurses. By addressing this gap, we aim to help develop more effective education and support systems and ultimately improve the quality of care provided to patients at the end of life.

Materials and methods

Study design and setting

The study employed a cross-sectional descriptive design and was conducted in three major hospitals affiliated with Kerman University of Medical Sciences: Afzalipour, Shafa, and Bahonar. These hospitals were selected due to their status as the largest and most well-equipped in Kerman, offering a wide range of departments, which was essential for the study. Additionally, their affiliation with the University of Medical Sciences facilitated better conditions for data collection and ensured greater cooperation from the hospital staff. Sampling lasted from June 2023 to the end of September.

Sampling and sample size

The study included all nurses from intensive care units and general wards of hospitals affiliated with Kerman University of Medical Sciences (Hospitals A, B, C). The inpatient departments studied included, pulmonary, internal medicine, neurological, digestive, burns, nephrology, surgery departments, Trauma, Surgery and, General ICUs. A total of 300 nurses were included in the study using convenience sampling, with 150 individuals in each group. There were no dropouts or withdrawals. The inclusion criteria included nurses who were employed in hospitals affiliated with Kerman University of Medical Sciences during the study, had a minimum of three months of work experience in intensive care units or general wards (the minimum time required for nurses to familiarize themselves with the methods, work flows and specific challenges of their units), and held a nursing degree. The exclusion criterion involved incomplete questionnaires (for which more than 10% of the data were missing).

The preliminary study was conducted to gather initial data and refine the parameters for our main research. This study included 30 individuals, divided equally between two groups: 15 nurses from intensive care units and 15 from general wards. The primary objectives of the preliminary study were to assess baseline variability in key outcome measures and to estimate effect sizes relevant to our research hypotheses. Data collected from this preliminary phase indicated the variability of outcomes and provided initial estimates of effect sizes, which were critical for determining the appropriate sample size for the main study. Using these preliminary findings and using

the following formula, ($Z(1-\alpha/2)=1.96$, $Z1-\beta=0.84$), the sample size for this research was estimated 300 individuals (150 in each group).

$$n = \frac{\left(z_{(1-\frac{\alpha}{2})} + z_{1-\beta}\right)^2 (S_1^2 + S_2^2)}{(\mu_1 - \mu_2)^2}$$

The confidence coefficient was 95%, resulting in a confidence interval of 1.96. Additionally, the type II error was calculated to be 20% (0.84).

Data collection instruments

The following data collection tools were utilized to achieve the research objectives: a demographic and background information questionnaire, the Palliative Care Knowledge Test, and the Palliative Care Self-Efficacy Scale (PCSES).

Demographic and background information questionnaire

This questionnaire included information about age, sex, education level, marital status, nursing position, nursing work experience, department of employment, history of participation in palliative care training courses, experience of a family member or friend's death, and experience caring for dying patients.

Palliative care knowledge test (PCKT)

This test was utilized to assess nurses' knowledge of palliative care. This questionnaire, developed by Nakazawa et al. (2009) from the University of Tokyo, consists of 20 items that evaluate various aspects of palliative care for physicians and nurses. The questionnaire comprises five subscales, including philosophy (two questions), pain (six questions), Dyspnoea (four questions), neuropsychiatric disorders (four questions), and gastrointestinal disorders (four questions). Each item requires a "true" or "false" response. The results of the scale were calculated against the correct answers and a total mark (between 0 and 20) was given for each participant. The higher grade indicates a higher knowledge about PC [27]. Monica Lopez-Garcia et al. (2020) first adapted this questionnaire to Spanish and demonstrated high content validity and good reliability of the questionnaire. The internal consistency, calculated using the Kuder-Richardson 20.0 formula (0.741), showed reliability similar to that of the original version (0.81). The content validity of the PCKT-SV was measured with a content validity rate of 0.87, indicating adequate values [28].

In this study, the questionnaire was initially translated by two experts in the field of English language and then re-translated by two other experts. After ensuring conceptual alignment with the original version, the questionnaire was reviewed by 10 experts in ICUs, General

departments (including doctors, nurses), and faculty members of the Razi School of Nursing and Midwifery), confirming its validity. The reliability of the questionnaire was assessed by 30 nurses who were included in the research sample. Its reliability was calculated using the Split-half method, yielding a coefficient of 0.8.

Palliative care self-efficacy scale (PCSES)

The Palliative Care Self-Efficacy Scale, developed by Phillips J et al. (2011), consists of 12 items and two subscales: perceived capability to answer end-of-life care concerns of patients and perceived capability to respond to patients' end-of-life symptoms. This questionnaire uses a 4-point Likert scale (1=need further basic instruction, 2=confident to perform with close supervision/coaching, 3=confident to perform with minimal consultation, or 4=confident to perform independently). Scores range from 12 to 48, with higher scores indicating greater palliative care self-efficacy. The questionnaire has shown strong validity, as evidenced by a Cronbach's alpha coefficient of 0.92 for the entire scale, and 0.87 and 0.91 for the subscales "perceived capability to answer end-of-life care concerns of patients" and "perceived capability to respond to patients' end-of-life symptoms," respectively [29].

In Iran, the questionnaire was translated from English to Persian by Dehghani et al. (2019) and back-translated into Persian by one of the faculty members. After confirming the translation, face, and content validity were assessed using expert judgments, and quantitative validity indices were assessed, resulting in a content validity ratio of 0.99 and a content validity index of 0.8. The reliability of the questionnaire was measured using Cronbach's alpha, which was 0.84 for the first six items (psychosocial support subscale) and 0.78 for the second six items (symptom management subscale). The Cronbach's alpha for the entire questionnaire was estimated to be 0.70 [30].

Data collection

After obtaining the code of ethics from the ethics committee of the Kerman University of Medical Sciences and receiving the required permits from the Razi School of Nursing and Midwifery, the study objectives were presented to the officials of the aforementioned departments. Subsequently, permission for data collection was obtained from the nurse manager at the medical centers. The first author fully explained the objectives of the study to the participants, and explained how the data would be collected. At the end, if a participant had any questions, their questions would be answered. Comprehensive explanations were provided to ensure the confidentiality and anonymity of the participants, and written informed consent was obtained from all individuals. Furthermore,

participants were assured that their decision to take part in the study would not affect their employment or professional position. Information was collected by a master's student in nursing who had completed the research method course and was trained in this field. Participants

Table 1 Characteristics of nurses working in ICUs and general wards of hospitals affiliated with Kerman University of Medical Sciences in 2023

Variable		ICU nurses		General ward nurses	
		Frequency	Percent	Frequency	Percent
Sex	Female	126	84.0	111	74.0
	Male	24	16.0	39	26.0
Marital status	Single	56	37.3	76	50.7
	Married	94	62.7	73	48.7
	Divorced/ widowed	-	-	1	0.6
Education level	Bachelor's degree	139	92.7	142	94.7
	Master's degree	11	7.3	8	5.3
Workplace	Bahonar	54	36.0	46	30.7
	Shafa	47	31.3	33	22.0
	Afzalipur	49	32.7	71	47.3
Position	Head nurse	7	4.7	7	4.7
	Clinical nurse	143	95.3	143	95.3
Shift type	Rotating	142	94.7	141	94.0
	Fixed	8	5.3	9	6.0
Participation in palliative care training courses	Yes	50	33.3	25	16.7
	No	100	66.7	125	83.3
Caring for a dying patient in the hospital	Yes	138	92.0	128	85.3
	No	12	8.0	22	14.7
Caring for a dying patient at home	Yes	38	25.3	31	20.7
	No	112	74.7	119	79.3
Experience of a friend's or family member's death	Yes	103	68.7	102	68.0
	No	47	31.3	48	32.0

who voluntarily provided written consent to participate then completed self-administered questionnaires in paper. After all participants completed the questionnaires, the researcher revisited the wards and ICUs and collected the completed questionnaires.

The questionnaire required approximately 10–15 min for each participant to complete. Following completion, each participant received a token of appreciation in the form of a gift, comprising a bottle of water and a cup.

Data analysis

In this study, the data were analyzed using SPSS 23. Descriptive statistics (frequency, percentage, mean, and standard deviation) and inferential statistics (independent t-test, Mann-Whitney U test, and multivariate linear regression) were employed. Statistical significance was determined by a p-value of ≤ 0.05 .

Results

Background characteristics of nurses working in the ICUs and general wards

A total of 300 participants completed the questionnaire and the response rate was 100%. The mean ages of the nurses working in the ICU and general wards were 33.02 ± 6.36 and 31.55 ± 6.35 years, respectively. The majority of nurses in both the ICU and general wards were female, married, held a bachelor's degree, and worked as clinical nurses. Additionally, most of the nurses in both groups worked rotating shifts. Other background characteristics provided in Table 1.

Comparison of the mean palliative care knowledge scores of nurses working in intensive care units and nurses working in general wards

In the group of nurses working in intensive care units, the most correct answers were given to the items "One of the objectives of pain management is to get a good night's sleep," "Palliative care should be provided only to patients who cannot have a curative treatment," and "Palliative care should not be provided at the same time as a cancer treatment." The least accurate answers were given to the items "Oxygen saturation levels correlate shortness of breath," "Long-term use of opioids often results in addiction," and "There are no routes except the central venous for patients unable to maintain a peripheral intravenous line."

In the group of nurses working in general wards, the most correct answers were given to the items "Palliative care should be provided only to patients who cannot have a curative treatment," "One of the objectives of pain management is to get a good night sleep," and "Palliative care should not be provided at the same time as a cancer treatment." The least accurate answers were given to the items "Oxygen saturation levels correlate shortness of

Table 2 Description of palliative care knowledge among nurses working in intensive care units and general wards in hospitals affiliated with Kerman University of Medical Sciences in 2023

Item	Correct responses of ICU nurses		Correct responses of general ward nurses	
	Frequency	Percent	Frequency	Percent
1. Palliative care should be provided only to patients who cannot have a curative treatment. (F)	138	92.0	138	92.0
2. Palliative care should not be provided at the same time as cancer treatment. (F)	128	85.3	124	82.7
3. One of the objectives of pain management is to get a good night's sleep. (T)	139	92.7	130	86.7
4. When cancer pain is mild, pentazocine should be administered more often than an opioid. (F)	66	44.0	52	34.7
5. When opioids are taken on a scheduled basis, NSAIDs should not be administered. (F)	71	47.3	65	43.3
6. The effect of opioids decreases when administered together with pentazocine or buprenorphine hydrochloride. (T)	84	56.0	93	62.0
7. Long-term use of opioids often results in addiction. (F)	30	20.0	31	20.7
8. The use of opioids does not affect survival time. (T)	98	65.3	89	59.3
9. Morphine should not be used to relieve shortness of breath in cancer patients. (T)	69	46.0	74	49.3
10. When opioids are taken on a scheduled basis, respiratory depression is common. (F)	51	34.0	34	22.7
11. Oxygen saturation levels correlate with shortness of breath. (F)	25	16.7	30	20.0
12. Anticholinergic drugs or scopolamine are effective in reducing bronchial secretions in terminally ill patients. (T)	115	76.7	118	78.7
13. In the last days of life, drowsiness associated with electrolyte imbalance decreases patient discomfort. (T)	69	46.0	69	46.0
14. Benzodiazepines are effective in controlling delirium. (T)	71	47.3	79	52.7
15. Some terminally ill patients require continuous sedation to relieve suffering. (T)	122	81.3	109	72.7
16. In patients with terminal cancer, morphine is often one of the causes of delirium. (F)	68	45.3	85	56.7
17. In the final stages of cancer, a higher caloric intake is needed compared to the initial stages. (F)	54	36.0	55	36.7
18. There are no routes except for the central venous for patients unable to maintain a peripheral intravenous line. (F)	38	25.3	38	25.3
19. Steroids improve appetite in patients with advanced cancer. (T)	74	49.3	84	56.0
20. Intravenous infusion is not effective in relieving dry mouth in dying patients. (T)	78	52.0	67	44.7

F: False, T: True

Table 3 Comparison of the mean scores of palliative care knowledge in nurses working in intensive care units and general wards in hospitals affiliated with Kerman University of Medical Sciences in 2023

Group	ICU nurses		General nurses		Statistical analysis*	P value
Palliative care knowledge	Mean	SD	Mean	SD		
Philosophy	1.77	0.49	1.75	0.52	-0.44	0.66
Pain	3.25	1.01	3.07	1.16	-1.75	0.08
Respiratory disorders	1.73	0.96	1.71	0.86	-0.05	0.96
Neuropsychiatric disorders	2.20	0.92	2.28	0.96	-0.82	0.41
Gastrointestinal disorders	1.62	1.03	1.63	1.03	-0.08	0.94
Total	10.59	2.10	10.43	2.33	0.62	0.53

*To compare the total scores of the independent t-test and other items of the Mann-Whitney U test

breath," "Long-term use of opioids often results in addiction," and "There are no routes except the central venous for patients unable to maintain a peripheral intravenous line" (Table 2).

There was no significant difference in the mean scores for palliative care knowledge between nurses working in intensive care units and nurses working in general wards. Additionally, the total scores of palliative care knowledge for nurses working in the ICU and general wards were 10.59 and 10.43, respectively, indicating no significant difference in palliative care knowledge between the two groups (Table 3).

Comparison of the mean palliative care self-efficacy scores of the nurses working in intensive care units and nurses working in general wards

The highest levels of palliative care self-efficacy were associated with the items "Reacting to and coping with nausea /vomiting," and "Reacting to reports of pain from the patient" (Table 4).

The total scores of palliative care self-efficacy for nurses working in the ICU and general wards were 28.01 ± 10.29 and 27.98 ± 10.33 , respectively, indicating that there was no significant difference in palliative care self-efficacy between the two groups ($P=0.98$). In addition, there were

Table 4 Description of palliative care self-efficacy in nurses working in intensive care units and general wards in hospitals affiliated with Kerman University of Medical Sciences in 2023

Item	ICU nurses		General nurses	
	Mean	SD	Mean	SD
1- Answering patient questions about the dying process	1.89	1.01	1.77	0.98
2- Supporting the patient or family member when they become upset	2.04	1.03	2.06	1.06
3- Informing people of the support services available	1.97	1.02	2.07	0.98
4- Discussing different environmental options (e.g. hospital, home, family)	2.11	0.97	2.17	1.01
5- Discussing patients' wishes after their death	1.94	0.94	2.11	0.98
6- Answering queries about the effects of certain medications	2.47	1.12	2.39	1.09
7- Reacting to reports of pain from the patient	2.69	1.15	2.63	1.08
8- Reacting to and coping with terminal delirium	2.56	1.09	2.51	1.09
9- Reacting to and coping with terminal dyspnea (breathlessness)	2.61	1.13	2.57	1.07
10- Reacting to and coping with nausea /vomiting	2.71	1.11	2.63	1.11
11- Reacting to and coping with reports of constipation	2.71	1.12	2.70	1.09
12- Reacting to and coping with limited patient decision-making capacity	2.30	1.03	2.37	1.03

no differences between the two groups regarding perceived capability to answer end-of-life care concerns and perceived capability to respond to patients' end-of-life symptoms ($P > 0.05$).

Determination of the palliative care knowledge score and palliative care self-efficacy score according to background variables

A multivariate stepwise regression was employed to explore the predictors of palliative care knowledge in nurses. Palliative care knowledge was the dependent variable, while age, work experience, workplace, participation in palliative care training courses, and history of caring for dying patients in the hospital and at home were the independent variables. The results indicated that 9.2% of the variance in palliative care knowledge was influenced by the variables of caring for dying patients in the

hospital and at home, workplace, and work experience. In other words, the palliative care knowledge score was 1.13 points greater for individuals with a history of caring for dying patients in the hospital than for those without this history. Additionally, the palliative care knowledge score was 0.76 points greater for individuals with a history of caring for dying patients at home than for those without this history. Furthermore, the palliative care knowledge score for nurses working at Bahonar Hospital was 0.81 points greater than that for nurses working at Afzalipur Hospital. Moreover, for a one-year increase in work experience, the palliative care knowledge score increased by 0.05. The other variables did not exhibit a significant relationship with the palliative care knowledge score (Table 5).

A multivariate stepwise regression was used to analyze the predictive variables of palliative care self-efficacy in nurses. Palliative care self-efficacy was the dependent variable, while palliative care knowledge, age, work experience, marital status, position, type of shift, participation in palliative care training courses, history of caring for dying patients in the hospital and at home, and experience of the death of a friend or family member were the independent variables. The results revealed that 21% of the variance in palliative care self-efficacy was influenced by age, history of participation in palliative care training courses, and palliative care knowledge score. In other words, the palliative care self-efficacy score increased by 0.61 for every one-year increase in age. Additionally, the palliative care self-efficacy score was 3.32 points higher for individuals who had a history of participating in palliative care training courses than for those who did not have this history. Furthermore, for every one-point increase in palliative care knowledge, the palliative care self-efficacy score increased by 0.65. The other variables were not significantly related to the palliative care self-efficacy score (Table 6).

Discussion

The results of the present study showed the average level of knowledge of the two groups, and there was no significant difference in palliative care knowledge between nurses working in ICUs and nurses working in general wards. Philosophy, pain, respiratory, neuropsychiatric,

Table 5 Regression coefficients of the effect of underlying variables on palliative care knowledge in nurses working in hospitals affiliated with Kerman University of Medical Sciences in 2023

Independent variable	b	S.E	β	T	P value	Confidence interval of 95%
Caring for a dying patient in the hospital	1.13	0.39	0.16	2.88	0.004	1.89–0.36
Caring for a dying patient at home	0.76	0.31	0.14	2.46	0.01	1.36 – 0.15
Workplace (Bahonar vs. Afzalipur)	0.81	0.26	0.17	3.08	0.002	1.32–0.29
Work experience (year)	0.05	0.02	0.13	2.15	0.03	0.09–0.004

(Adjusted $R^2 = 0.092$) $F = 8.56$ ($P < 0.001$)

Table 6 Regression coefficients of the influence of underlying variables and palliative knowledge care on palliative care self-efficacy in nurses working in hospitals affiliated with Kerman University of Medical Sciences in 2023

Independent variable	b	S.E	β	T	P value	Confidence interval of 95%
Age	0.61	0.08	0.38	7.19	< 0.001	0.78– 0.45
history of participation in palliative care training courses	3.32	1.24	0.14	2.66	0.008	5.77– 0.87
Palliative care knowledge	0.65	0.25	0.14	2.59	0.01	1.15– 0.16

(Adjusted R²=0.21) F=26.81 (*P*<0.001)

and gastrointestinal disorders domain were not significantly different between the two groups.

The lack of difference in knowledge between the two groups could be attributed to some factors. Both groups likely have access to similar continuing education opportunities, which leads to comparable knowledge levels. Additionally, nurses gain experience on the job, with ICU nurses encountering palliative situations due to the critical nature of their work, while general ward nurses manage palliative care over longer periods. This on-the-job learning may help balance their overall knowledge.

Based on the searches, researchers did not identify any similar studies in the current field. Most related research has focused on single cohorts, and only a few have investigated the relationship between palliative care knowledge and variables such as the workplace. Consequently, the researchers used studies that were most closely related to the current one to discuss and compare the findings. In this context, and in line with the results of the present study, the findings of Iranmanesh et al. (2014) [15] reported a general lack of sufficient palliative care knowledge with no significant correlation to workplace setting. This consistency suggests that in both studies, educational opportunities and on-the-job learning may provide a balanced level of knowledge across different nursing contexts.

In contrast, Ashrafizadeh (2022) [23] and Wijesinghe (2023) [31] reported varying levels of palliative care knowledge among different departments, with pediatric and surgical ward nurses showing more knowledge than their ICU counterparts. This divergence could stem from regional differences in healthcare systems and educational practices. Such discrepancies may also reflect variations in study methodologies, sample sizes, or definitions of “insufficient knowledge.” Furthermore, Choi et al. (2012) [32] observed higher palliative care knowledge in oncology departments compared to general and ICU settings. This difference may be due to the specialized nature of oncology departments, where focused palliative care training might be more prevalent compared to general or ICU settings. The present study has not captured the specific effects of specialized training programs. Additionally, evolving palliative care practices and educational standards, along with differences in continuing education focus, may account for discrepancies between studies.

The findings related to palliative care self-efficacy revealed that nurses’ self-efficacy scores were lower than the midpoint of the questionnaire, and there was no significant difference in self-efficacy between nurses in ICUs and those in general wards. This contrasts with the results of Evenblij (2019), who found that self-efficacy in mental health care personnel was greater than in those working in nursing homes or home care [33]. Additionally, Cha et al. (2020) reported nurses working in hospice demonstrated greater self-efficacy than those in medical and neurology departments, while those in rehabilitation, surgery, ICU, emergency, and anesthesia departments exhibited lower palliative care self-efficacy than their peers in internal medicine and neurology wards [34].

These discrepancies may be explained by the different healthcare contexts in which the studies were conducted. In Iran, where our study was carried out, palliative care is a part of routine care. This systemic integration means that all healthcare professionals are expected to possess palliative care skills, potentially leading to more uniform self-efficacy scores across different nursing settings. In contrast, the studies by Evenblij and Cha were conducted in contexts where palliative care might not be as uniformly integrated, resulting in more significant differences in self-efficacy based on departmental focus. Additionally, the lower overall self-efficacy scores in our study might reflect broader challenges in palliative care specialized training and support within the healthcare system, suggesting a need for further professional development in this area.

As Dehghani (2020) wrote that medical education in Iran primarily focuses on symptomatic care rather than comprehensive care, resulting in less emphasis on fundamental elements of palliative care such as family dynamics and interdisciplinary teamwork, as well as psychological and spiritual aspects of care [24].

Ansari et al. (2018) suggested that palliative care is a relatively new concept in Iran and that care providers lack expertise in delivering palliative services [35]. Unfortunately, palliative care education has not been widely integrated into nursing education programs. These programs often prioritize acute nursing care and provide limited focus on end-of-life care [33]. Even though certain nursing caregivers in ICUs possess master’s degrees in the ICU and have completed theoretical and clinical training in palliative care spanning two years, no significant

difference in the self-efficacy of these two groups was observed. It should be noted that palliative care is still in its early stages in Iran and has not been fully established. Most of the care received by patients comes from their families, and the services provided by medical centers to patients in need of palliative care are like those offered to other patients. Thus, the completion of multiple course credit may not substantially increase the self-efficacy of ICU nurses beyond that of their peers in other departments. Rassouli et al. (2016) also highlighted the current state of palliative services for Iranian patients, noting that family members are typically responsible for caring for patients with incurable diseases, particularly terminally ill patients. While all hospitals admit and provide services to these patients, dedicated services for them are quite limited. These patients can be admitted to hospitals to receive only routine services [36].

The study findings showed variables such as caring for dying patients in both the hospital and the home, the workplace, and work experience were predictors of nurses' knowledge of palliative care. These results are consistent with those of Etafa et al. (2020), who reported a significant relationship between nurses' total mean palliative care knowledge score and their experience providing palliative care [1]. Two other studies also demonstrated a significant association between nurses' palliative care knowledge, their history of caring for dying patients, and their work experience in providing palliative care [15, 16, 22, 23, 34]. These findings align with the present study, indicating that individuals with experience caring for dying patients possess greater knowledge than do those without such experience. Caring for dying patients, whether in a hospital or at home, places nursing caregivers in a position to provide optimal care, potentially leading to increased knowledge through further study and seeking assistance from others. As noted by Getie (2021), experience caring for patients requiring palliative care serves as a valuable source of knowledge due to ongoing patient exposure [37]. Notably, knowledge is a fundamental element in nursing practice and enhances performance [24]. This finding suggests that hands-on experience with end-of-life care in different environments contributes to a better understanding of palliative care principles. Hospitals and home settings may offer distinct challenges and learning opportunities, emphasizing the need for diversified experiences in training programs.

The study findings regarding relationship between knowledge toward palliative care and demographic characteristics showed that nurses at Hospital A exhibited greater knowledge than did those at Hospitals B and C. Bahaonar Hospital, the first and oldest hospital in Kerman and the first teaching hospital affiliated with Kerman University of Medical Sciences, historically admitted

patients with various medical/surgical disorders, and was the first to establish an intensive care unit. Consequently, the extensive experience of this hospital in treating patients with diverse health conditions, including acute, chronic, and potentially end-of-life cases, has likely contributed to the nurses' increased expertise in managing such patients, resulting in their greater level of knowledge than their peers at other hospitals.

Furthermore, the results indicated that for a one-year increase in work experience, the palliative care knowledge score increased by 0.05 points, suggesting that participants with greater work experience possessed more palliative care knowledge. These findings are consistent with those of Martín-Martín et al. (2021), Ashrafizadeh et al. (2022), Iranmanesh et al. (2014), Etafa et al. (2020), Ayed et al. (2015), and Altarawneh (2023) [1, 15, 23, 38–40], all of which involve correlations between nurses' knowledge and their work experience. This consistency may be attributed to the fact that nurses with more work experience in various roles have probably dealt with a wide range of patient care scenarios, including those involving terminally ill patients or individuals in need of specialized care such as pain management, spiritual support, and end-of-life issues. This exposure reduces their anxiety and enhances their expertise, thereby increasing their knowledge. Additionally, encountering new conditions during years of work experience causes individuals to engage in further study and seek answers to areas in which they may be less knowledgeable, thereby expanding their expertise. Cha (2020) demonstrated that nursing knowledge is fundamentally enhanced through personal, experiential, ethical, and aesthetic knowledge. When experiential knowledge is increased through aesthetic and personal knowledge, moral anxieties are resolved through reflection and education [34]. As professionals gain more experience, their exposure to various situations may contribute to a deeper knowledge of palliative care. This finding emphasizes the need for ongoing professional development and mentorship to enhance palliative care competencies over time.

The study findings revealed a significant relationship between age and palliative care self-efficacy. These results align with Herrero-Hahn's study (2019), which also indicated that older professionals exhibited higher levels of palliative care self-efficacy [41]. While the number of similar studies is limited, several factors may contribute to the observed association between age and palliative care self-efficacy. One plausible explanation is the accumulation of clinical experience over time. Older nurses, for example, may have encountered a wider range of palliative care scenarios, thereby developing a broader skill set and a deeper understanding of patient needs. This increased exposure to diverse situations can lead

to higher levels of self-efficacy in managing the complex aspects of palliative care.

In this study, participation in palliative care training courses emerged as a significant predictor of palliative care self-efficacy. Kim et al. (2020) also reported that nurses who received palliative care training exhibited higher levels of palliative care self-efficacy [2]. Similarly, Cha et al. (2020) indicated that individuals who completed palliative care training demonstrated greater self-efficacy. They suggested that prior training and experience could serve as opportunities to enhance the confidence of those caring for end-of-life patients, thereby improving the quality of care [34]. This finding aligns with Bandura's social cognitive theory, which underscores the role of experiences and mastery in the development of self-efficacy [42]. This emphasizes the importance of targeted education and continuous learning in enhancing healthcare professionals' confidence in delivering palliative care. Incorporating comprehensive training programs may be a key strategy to improve self-efficacy levels among professionals.

This study also had limitations. One limitation of this study is the crowded departments and the heavy workload of nurses in ICUs and other departments, which made it challenging to complete the questionnaires. To address this issue, the researcher coordinated with the departments and distributed the questionnaires to participants during less crowded hours, at the end of the shift work, or before the start of the shift work. Additionally, the study sample was drawn from a single urban area, thereby limiting the generalizability of the findings to the entire population of nurses. Since there is no palliative care setting in Iran and there are not enough theoretical and clinical courses during study of nursing major, we were interested to check if working in the different ward may affect nurses palliative care knowledge and self-efficacy. It seems nurses in ICU wards take care more frequently from patients with the palliative care needs. Future studies it is needed to clear factors affecting nurses palliative care knowledge and self-efficacy in different wards.

To address these limitations, future research could employ multi-center studies to enhance generalizability and provide a more comprehensive understanding of the issue. Additionally, qualitative investigations could be conducted to explore nurses' perceptions and experiences in greater depth, offering richer, more nuanced insights. Considering the generalizability of the study findings beyond the specific context of Iranian hospitals is also important. Future research directions might include longitudinal studies to assess the long-term impact of palliative care education and training on nurses' knowledge, self-efficacy, and patient outcomes, thereby providing a

more robust and enduring understanding of the effects of such educational interventions.

Conclusion

The research results indicated that the total scores of palliative care knowledge and self-efficacy, as well as their respective dimensions, did not significantly differ between nurses working in ICUs and those working in general wards. Given the importance of palliative care and the fact that the establishment of palliative care centers in Iran is still in the early stages, it is essential to incorporate palliative care units into nursing curricula to increase the level of knowledge and self-efficacy in this area. Furthermore, in-service palliative care training courses should be made available to nurses and nursing educators to ensure that they are adequately prepared to care for patients and train students. Short-term training programs focusing on various aspects of palliative care can enhance the knowledge and self-efficacy of nurses across different departments, equipping them to confront the psychological challenges of palliative care. Our research found no significant differences in palliative care knowledge and self-efficacy scores among nurses in ICUs and general wards. Given the vital role of palliative care and the nascent state of palliative care centers in Iran, short-term training programs, with a focused approach on various aspects of palliative care, can be instrumental in enhancing the capabilities of nurses across different departments. This comprehensive approach ensures that nurses are well-equipped to address the psychological complexities associated with palliative care, ultimately leading to improved patient outcomes.

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Author contributions

S.F., M.A.F., and M.D. designed the study and collected data. S.F., M.A.F., M.M., A.J.F., and M.D. contributed to the study design, they provided critical feedback on the study and qualitative and quantitative analysis, and inputted to the draft of this manuscript. All authors have read and approved the final manuscript.

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Data availability

No datasets were generated or analysed during the current study.

Declarations

Ethical considerations

This study is based on the Declaration of Helsinki. This article belongs to the data collection carried out for the preparation of a master's thesis. The Kerman University of Medical Sciences Ethics Committee approved the study protocol (IR.KMU.REC.1401.440). A letter of introduction was obtained from the Faculty of Nursing and Midwifery to collect information. Written informed consent was obtained from the participants, who were given the freedom to participate or withdraw from the study at any time. The principle of confidentiality was strictly adhered to during the research process. Finally,

the general findings were shared with the participants and officials who desired to be informed about the study results. All methods were carried out in accordance with relevant guidelines and regulations.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Conflict of interest

The authors declare that they have no conflict of interest. They have no relevant financial or non-financial interests to disclose.

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