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End-of-life care knowledge and attitude in managing dying patients among healthcare workers in the emergency department

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Abstract:

OBJECTIVE: End-of-life care (EOLC) in the emergency department (ED) is a growing global necessity. This study aimed to assess the level of knowledge and attitudes toward EOLC among ED healthcare workers.

METHODS: A prospective and cross-sectional study was conducted involving 155 healthcare workers at a tertiary ED. The Palliative Care Knowledge Tool (PCKT) and the Frommelt Attitude toward Care of the Dying (FATCOD) Scale were adapted, translated into Malay, and validated for use. Participants completed validated, self-administered questionnaires assessing knowledge using FATCOD the PCKT and attitudes toward EOLC using the FATCOD Scale. The primary outcomes were the healthcare workers' knowledge and attitudes, with secondary analysis exploring associated factors.

RESULTS: The overall level of knowledge on EOLC among healthcare workers was poor with a mean score of 8.54 (±2.97) out of 17. Despite this, attitudes toward EOLC were positive with a mean score of 92.61 (±8.80) out of 120. A weak positive correlation was found between knowledge and attitudes ($r = 0.186$, $n = 155$, $P = 0.020$). The factors such as education level, work experience, and profession were significantly associated with variations in knowledge and attitudes.

CONCLUSION: This study revealed that despite poor knowledge of EOLC among healthcare workers in the ED, their attitudes toward managing dying patients were positive. The weak correlation between knowledge and attitudes suggests a modest link between these domains.

Keywords:

Emergency department, end-of-life care, palliative care

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Introduction

End-of-life care (EOLC) is a critical component of patient management for those presenting to the emergency department (ED), especially for certain patient populations.[1] This group includes elderly patients who frequently have several chronic illnesses, individuals with terminal conditions such as advanced cancer, and others facing end-stage diseases where continued active treatment is considered ineffective and death is imminent.[2]The increasing numbers of elderly patients, coupled with limited access to palliative care services and intensive care unit beds, often result in such patients being managed in the ED for extended periods.

This situation creates significant challenges to ED management, as ED training typically

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Box-ED section

What is already known on the study topic?

- End-of-life care (EOLC) in emergency departments (EDs) is essential yet often underemphasized
- Studies have highlighted a lack of awareness and knowledge of EOLC, particularly among less experienced emergency medicine doctors
- Emergency providers' knowledge and attitudes may be a barrier to adopting hospice and palliative care practices.

What is the conflict on the issue? Has it importance for readers?

- The conflict arises from the need to balance life-saving interventions with the provision of compassionate care for terminally ill patients in the ED
- Emergency medicine training often adopts a "save-all" mentality, leading to challenges in delivering EOLC
- This issue is significant as it impacts the quality of care provided to patients at the end of life, highlighting the necessity for improved training and awareness among healthcare professionals.

How is this study structured?

- The study is a prospective and cross-sectional analysis involving 155 healthcare workers at a tertiary center ED
- Participants completed validated, self-administered questionnaires assessing their knowledge using the Palliative Care Knowledge Tool and attitudes toward EOLC using the Frommelt Attitude Toward Care of the Dying Scale
- The primary outcomes were the healthcare workers' knowledge and attitudes
- The secondary analysis explores the factors influencing these outcomes.

What does this study tell us?

The study shows that although healthcare workers in the ED have limited knowledge of EOLC, they maintain a positive attitude toward caring for dying patients.

focuses on acute and life-saving interventions rather than on the nuances of EOLC.[3] As a result, the knowledge and attitudes of healthcare workers (HCWs) in the ED toward EOLC are crucial in ensuring that patients and their families receive compassionate and appropriate care. However, studies have shown that the knowledge and attitudes regarding EOLC among HCWs in the ED are often insufficient.[4,5]

This study aims to assess the level of knowledge and the attitudes of ED HCWs toward managing dying patients, to improve the quality of EOLC delivery in the emergency setting.

Methods

We conducted a cross-sectional study among HCWs in the ED of an urban tertiary care facility from August 2021 until August 2022. Participants included were medical officers, emergency physicians, nurses, and assistant medical officers (AMOs). An AMO is a licensed healthcare professional who supports clinical care and procedures in the ED, playing a vital role in triage, acute care, and timely patient stabilization. All HCWs working in the ED during the study period were eligible for inclusion, except those on temporary rotation.

The sample size was calculated using the Krejcie and Morgan formula for finite population sampling.[6] With an estimated population of 179 HCWs in the ED, the required sample size was determined based on a 95% confidence level, a 5% margin of error, and a population proportion (p) of 0.5 to maximize sample size. This yielded a required minimum of 125 participants. To account for a potential 10% nonresponse or dropout rate, the final target sample size was adjusted to 135 HCWs.

Participants were recruited using convenience sampling by distributing a Google Form link through messaging platforms. The research team sent multiple reminders via these channels to encourage participation. The self-administered questionnaire included study information and required informed consent. Confidentiality was ensured and data were collected anonymously. Participants were assured that their responses would remain confidential and would not affect their professional standing.

Participants completed a structured questionnaire comprising three sections: (1) demographics (gender, age, education, and experience), (2) EOLC knowledge, and (3) attitudes toward managing dying patients.

Knowledge was assessed using a modified Palliative Care Knowledge Tool (PCKT).[7] The original PCKT included 20 true/false/unsure questions. To suit the ED setting, we eliminated items related to drugs not available locally, such as Pentazocine, resulting in a 17-item tool. Each correct answer scored one point; incorrect or unsure responses scored zero. Total and mean scores were calculated.

Attitudes were assessed using the Frommelt Attitude Toward Care of the Dying Scale (FATCOD Form B), consisting of 30 items across two domains.[8] For negatively phrased items (Questions 3, 5-9, 11, 13-15, 17, 19, 26, 28, and 29), responses were reverse-coded.

Higher total scores indicate a more positive attitude, with a possible score ranging from 30 to 120.

Both instruments, the modified PCKT and Malay-translated FATCOD Form B were validated. The validation process included forward-backward translation into Malay with minimal discrepancies, expert content validation by a panel of five professionals (three emergency physicians, one palliative care consultant, and one senior nursing lecturer), and face validation with 20 HCWs. The Item-Content Validity Index (I-CVI) for the PCKT was 0.91, with a Universal Agreement (UA) of 0.82, while FATCOD Form B achieved an I-CVI of 0.96 and a UA of 0.87. A face validity test among 20 HCWs informed final adjustments, with language preferences noted.

A pilot study involving 139 HCWs from the departments other than emergency (including anesthesiology, oncology, medical, and surgical units) was conducted to assess internal consistency. The Kuder-Richardson Formula 20 (KR-20) was used to evaluate the reliability of instruments with dichotomous items. A value above 0.7 indicates acceptable internal consistency, suggesting that the items reliably measure the same construct. The modified PCKT achieved a KR-20 of 0.747, consistent with the reliability of the original tool.[7] The Cronbach's Alpha for the Malay version of FATCOD Form B was 0.825. These findings are consistent with the reliability of the original tools, supporting their use in this study. Validated Malay versions were distributed through Google Forms link.

The study received ethical approval from the Institute Ethics Committee for Human Studies on the date August 16, 2021 with approval number UKM PPI/111/8/JEP-2021-620. Participation was voluntary with informed consent obtained, and withdrawal was allowed at any time. Data were analyzed using the IBM SPSS Statistics v26, United States. Normality was tested with Shapiro–Wilk. Group differences were assessed using the *t*-tests and analysis of variance (ANOVA). Pearson correlation examined the link between knowledge and attitude. Multivariate regression tested gender's effect on attitude, adjusting for profession. Significance was set at $P < 0.05$.

Results

A total of 179 HCWs were recruited for the study, with 155 respondents, yielding a response rate of 86.6%, as shown in Table 1.

Table 1: Demographic information of the participants

Demographic	Frequency, *n* (%)
Profession	
Doctor	85 (54.8)
Nurse	48 (31.0)
AMO	22 (14.2)
Gender	
Male	64 (41.3)
Female	91 (58.7)
Age (years)	
21–30	35 (22.6)
31–40	110 (71.0)
41–50	10 (6.5)
Education	
Diploma	60 (38.7)
Degree	86 (55.5)
Master	9 (5.8)
Working experience (years)	
<5	38 (24.5)
6–10	76 (49)
11–15	28 (18.1)
16–20	10 (6.5)
More than 20	3 (1.9)
Previous EOLC training	
No	139 (89.7)
Yes	16 (10.3)
Personal experience in caring for dying person	
No	62 (40)
Yes	93 (60)
Interest in learning EOLC	
No	3 (1.9)
Yes	152 (98.1)
Importance of EOLC in ED	
No	4 (2.6)
Yes	151 (97.4)

EOLC: End-of-life care, ED: Emergency department, AMO: Assistant medical officer

Knowledge of end-of-life care

The mean score for knowledge was 8.54 (+2.97). The majority of participants correctly answered the item *"Some dying patients will require continuous sedation to alleviate suffering."* In addition, 84.52% correctly responded, *"One of the goals of pain management is to get a good night's sleep"*. However, only 16.77% of participants answered correctly regarding opioid addiction, as shown in Table 2.

Attitudes toward managing dying patients

The mean score for attitude was 92.61 (±8.80) out of 120, indicating a positive attitude toward managing dying patients. Most participants agreed with positive statements such as "Giving care to a dying person is a worthwhile experience" and rejected negative ones such as "I would not want to care for a dying person" [Table 3]. Doctors exhibited the most positive attitudes, followed by AMOs and nurses. Males scored higher than females. Attitudes were significantly associated with profession, gender, age, and education level.

A Pearson correlation analysis was conducted to examine the relationship between knowledge and attitude scores. The analysis revealed a weak but statistically significant

Table 2: Percentage of items answered correctly by the respondents

	Item	Frequency, *n* (%)
	Philosophy	
K01	Palliative care should only be provided from patients who have no curative treatments available	47 (30.32)
K02	Palliative care should not be provided along with other anti-cancer treatments	107 (69.03)
	Pain	
K03	One of the goals of pain management is to get a good night's sleep	131 (84.52)
K04	When opioids are taken on a regular basis, NSAIDs should not be used	93 (60.00)
K05	Long term use of opioids can often induce addiction	26 (16.77)
K06	Use of opioids does not influence survival time	89 (57.42)
	Dyspnoea	
K07	Morphine should be used to relieve dyspnoea in cancer patients (true)	88 (56.77)
K08	When opioids are used on a regular basis, respiratory depression will be common	40 (25.81)
K09	Oxygen saturation levels are correlated with dyspnoea	41 (26.45)
	Psychiatric problem	
K10	During the last days of life, downsizes associated with electrolyte imbalance should decrease patient discomfort	73 (47.10)
K11	Benzodiazepines should be effective for controlling delirium	105 (67.74)
K12	Some dying patients will require continuous sedation to alleviate suffering	149 (96.13)
K13	Morphine is often a cause of delirium in terminally ill cancer patients	60 (38.71)
	Gastrointestinal problem	
K14	At terminal stages of cancer, higher calorie intake is needed compared to early stages	48 (30.97)
K15	There is no route except central venous for patients unable to maintain a peripheral intravenous route	84 (54.19)
K16	Steroids should improve appetite among patients with advanced cancer	51 (32.90)
K17	Intravenous infusion will not be effective for alleviating dry mouth in dying patients	93 (60.00)

NSAIDs: Nonsteroidal anti-inflammatory drug

Table 3: Attitude towards caring for the dying patients

	Item	SD, *n* (%)	Disagree, *n* (%)	Agree, *n* (%)	SA, *n* (%)	Mean score±SD
A1	Giving care to the dying person is a worthwhile experience	0	3 (1.9)	40 (25.8)	112 (72.3)	3.703±0.5
A2	Death is not the worst thing that can happen to a person	25 (16.1)	29 (18.7)	50 (32.3)	51 (32.9)	2.819±1.965
A3	I would be uncomfortable talking about impending death with the dying person	12 (7.7)	40 (25.8)	55 (35.5)	48 (31)	2.103±0.934
A5	I would not want to care for a dying person	84 (54.2)	51 (32.9)	13 (8.4)	7 (4.5)	3.368±0.822
A6	The non family caregivers should not be the one talk about death with the dying person	26 (16.8)	46 (29.7)	43 (27.7)	40 (25.8)	2.374±1.045
A7	The length of time required giving care to a dying person would frustrate me	41 (26.5)	56 (36.1)	35 (22.6)	23 (14.8)	2.742±1.012
A8	I would be upset when the dying person I was caring for gave up hope of getting better	14 (9)	26 (16.8)	70 (45.2)	45 (29)	2.058±0.906
A9	It is difficult to form a close relationship with the dying person	24 (15.5)	54 (34.8)	58 (37.4)	19 (12.3)	2.536±0.9
A10	There are times when the dying person welcomes death	1 (0.6)	7 (4.5)	80 (51.6)	67 (43.2)	3.374±0.605
A11	When a patient asks, "Am I dying?" I think it is best to change the subject to something cheerful	24 (15.5)	37 (23.9)	51 (32.9)	43 (27.7)	2.271±1.034
A13	I would hope the person I'm caring for dies when I am not present	30 (19.4)	59 (38.1)	41 (26.5)	25 (16.1)	2.607±0.977
A14	I am afraid to become friends with a dying person	65 (41.9)	54 (34.8)	25 (16.1)	11 (7.1)	3.116±0.926
A15	I would feel like running away when the person actually died	67 (43.2)	69 (44.5)	10 (6.5)	9 (5.8)	3.252±0.819
A17	As a patient nears death, the nonfamily caregiver should withdraw from his/her involvement with the patient	73 (47.1)	53 (34.2)	15 (9.7)	14 (9)	3.194±0.947
A26	I would be uncomfortable if I entered the room of a terminally ill person and found him/her crying	16 (10.3)	42 (27.1)	55 (35.5)	42 (27.1)	2.207±0.958
A29	Family members who stay close to a dying person often interfere with the professional's job with the patient	18 (11.6)	52 (33.5)	51 (32.9)	34 (21.9)	2.348±0.951
A30	It is possible for nonfamily caregivers to help patients prepare for death	1 (0.6)	5 (3.2)	68 (43.9)	81 (52.3)	3.477±0.596

SD: Strongly disagree, SA: Strongly agree, SD: Standard deviation

positive correlation (r = 0.186, n = 155, P = 0.020), indicating that participants with higher knowledge scores tended to report slightly more positive attitudes toward EOLC.

Perceptions of patient- and family-centered care

Most participants agreed that families should be involved in physical care, need emotional support, and help dying members make the best of their remaining lives. They opposed statements implying that families should not be informed about the dying process or that dying patients should not be involved in decision-making. The highest mean score was for family involvement in care; the lowest was for limiting patient autonomy [Table 4].

Demographic factors and knowledge of end-of-life care

Independent *t*-test was used for the comparison between two groups (e.g., gender and prior EOLC training), and one-way ANOVA was applied for the variables with three or more categories (e.g., profession and age group). Knowledge scores varied significantly based on profession, gender, age, level of education, and years of experience [Table 5]. Doctors had the highest mean knowledge score and AMOs had the lowest. Male participants scored higher than females. Participants aged 31–40 years had the highest knowledge, while those aged 21–30 years had the lowest. Participants with a Master's degree demonstrated the highest scores, whereas those with a Diploma scored the lowest. HCWs with over 20 years of experience had the highest mean knowledge score, whereas those with <5 years had the lowest. The factors such as prior EOLC training, personal experience, interest in EOLC, and perceived importance in the ED were not significantly associated with knowledge scores.

Demographic factors and attitude toward end-of-life care

Independent *t*-test was used for the comparison between two groups (e.g., gender and prior EOLC training), and one-way ANOVA was applied for variables with three or more categories (e.g., profession and age group). A significant difference in attitude was observed based on profession, as shown in Table 6. Doctors and individuals aged 31–40 exhibited the most positive attitudes. Males scored higher than females. Those with Master's degrees had the highest attitude scores. There was no significant association between attitude and years of service, previous EOLC experience, or training.

To further assess the impact of gender on attitudes while accounting for professional roles, a multivariate linear regression analysis was performed. Gender was not an independent predictor (β =1.57, P = 0.290). In contrast, being a doctor was significantly associated with higher attitude scores compared to AMOs (β =4.94, P = 0.012), while nurses showed no significant difference (β = −2.18, P = 0.312). These findings suggest that gender-based differences are likely confounded by professional roles, especially given the higher proportion of female nurses.

Table 4: Perception of patients-and-family centred care

	Item	SD, *n* (%)	Disagree, *n* (%)	Agree, *n* (%)	SA, *n* (%)	Mean score±SD
A4	Caring for the patient's family should continue throughout the period of grief and bereavement	0	4 (2.6)	37 (23.9)	114 (73.5)	3.71±0.509
A12	The family should be involved in the physical care of the dying person	0	1 (0.6)	29 (18.7)	125 (80.6)	3.8±0.417
A16	Families need emotional support to accept the behaviour changes of the dying person	0	2 (1.3)	40 (25.8)	113 (72.9)	3.716±0.48
A18	Families should be concerned about helping their dying member make the best of his/her remaining life	1 (0.6)	1 (0.6)	30 (19.4)	123 (79.4)	3.774±0.44
A19	The dying person should not be allowed to make decisions about his/her physical care	54 (34.8)	49 (31.6)	21 (13.5)	31 (20)	2.813±1.121
A20	Families should maintain as normal an environment as possible for their dying member	0	15 (9.7)	55 (35.5)	85 (54.8)	3.452±0.666
A21	It is beneficial for the dying person to verbalize his/her feelings	1 (0.6)	5 (3.2)	38 (24.5)	111 (71.6)	3.671±0.571
A22	Care should extend to the family of the dying person	0	2 (1.3)	41 (26.5)	112 (72.3)	3.71±0.483
A23	Caregivers should permit dying persons to have flexible visiting schedules	1 (0.6)	10 (6.5)	48 (31)	96 (61.9)	3.542±0.647
A24	The dying person and his/her family should be the in charge decision makers	3 (1.95)	14 (9)	61 (39.45)	77 (49.7)	3.368±0.729
A25	Addiction to pain relieving medication should not be a concern when dealing with a dying person	9 (5.8)	33 (21.3)	55 (35.5)	58 (37.4)	3.045±0.907
A27	Dying persons should be given honest answers about their condition	3 (1.9)	7 (4.5)	64 (41.3)	81 (52.35)	3.439±0.675
A28	Educating families about death and dying is not a nonfamily caregiver responsibility	57 (36.8)	60 (38.7)	22 (14.2)	16 (10.3)	3.019±0.963

SD: Strongly disagree, SA: Strongly agree, SD: Standard deviation

Table 5: Association between demographic variables and healthcare worker's level of knowledge on end-of-life care

Demographic (*n*)	Total knowledge score	
	Mean±SD	*P*
Profession		
Doctor	10.07±2.45	<0.001*,b
Nurse	6.83±2.31	
AMO	6.41±2.77	
Gender		
Male	9.38±3.18	0.003*,a
Female	7.97±20.67	
Age (years)		
21–30	6.66±2.40	<0.001*,b
31–40	9.12±2.88	
41–50	8.9±3.21	
Education		
Diploma	6.62±2.32	<0.001*,b
Degree	9.71±2.72	
Master	10.33±2.24	
Working experience (years)		
<5	6.63±2.33	<0.001*,b
6–10	9.76±2.97	
11–15	8.04±2.10	
16–20	7.3±2.87	
More than 20 (3)	11±1.73	
Previous EOLC training		
No	8.68±2.94	0.114[a]
Yes	7.44±3.01	
Personal experience in caring dying person		
No	8.79±3.25	0.409[a]
Yes	8.39±2.77	
Interest in learning EOLC		
No	8.33±2.08	0.900[a]
Yes	8.55±2.99	
Importance of EOLC in ED		
No	6.25±0.96	0.117[a]
Yes	8.61±2.98	

[a]Independent *t*-test, [b]One-way ANOVA. *A *P*<0.05 was considered statistically significant. AMO: Assistant medical officer, ED: Emergency department, EOLC: End-of-life care, SD: Standard deviation

Table 6: Association between demographic variables and healthcare workers's attitude towards managing the dying patients

Demographic	Total attitude score	
	Mean±SD	*P*
Profession		
Doctor	95.78±8.60	0.000*,b
Nurse	87.88±7.08	
AMO	90.64±7.97	
Gender		
Male	95.22±9.23	0.002*,a
Female	90.77±8.03	
Age (years)		
21–30	89±7.65	0.021*,b
31–40	93.68±8.99	
41–50	93.4±7.63	
Education		
Diploma	87.97±7.48	0.000*,b
Degree	95.07±8.14	
Master	100±9.18	
Working experience (years)		
<5	90.66±7.54	0.059[b]
6–10	94.62±9.39	
11–15	90.29±8.63	
16–20	90.2±7.05	
More than 20	96±5.00	
Previous EOLC training		
No	92.81±8.47	0.408[a]
Yes	90.88±11.45	
Personal experience in caring dying person		
No	91.79±8.13	0.347[a]
Yes	93.15±9.22	
Interest in learning EOLC		
No	92.33±6.43	0.957[a]
Yes	92.61±8.85	
Importance of EOLC in ED		
No	86.5±9.26	0.160[a]
Yes	92.77±8.76	

[a]Independent *t*-test, [b]One-way ANOVA. *A *P*<0.05 was considered statistically significant. AMO: Assistant medical officer, ED: Emergency department, EOLC: End-of-life care, SD: Standard deviation

Discussion

This study demonstrated an overall poor level of knowledge of EOLC among HCWs in ED, which is similar to previous findings in doctors and nurses.[9,10] However, most of the prior studies only involved either doctors or nurses,[11-13] limiting direct comparison, as our studies assessed knowledge across three professional groups.

Knowledge of EOLC among doctors in our study was poor, aligning with studies done among HCW's in Spain and among emergency physicians in Kuwait.[9,11] Although EOLC or palliative care has been increasingly incorporated into undergraduate medical curricula worldwide in recent years, many doctors in our study may have graduated before such training was introduced.[14] Hence, only a small percentage reported having received prior EOLC training. However, our study showed that doctors had the highest mean EOLC knowledge scores compared to nurses and AMOs; which was also demonstrated in two previous studies.[9,10] This is likely due to doctors having a clearer understanding of the questionnaire content. Many knowledge items focused on symptom management, aligning with doctors' clinical training and experience.

The level of EOLC knowledge among nurses in our studies was insufficient, coherent with other findings.[9,10,15] Previous studies demonstrated low EOLC knowledge among nurses, possibly due to the lack of EOLC curricula in the certificate, diploma, or undergraduate nursing

curricula.[16] Meanwhile, AMOs displayed the lowest level of knowledge on EOLC. To our knowledge, no previous study has specifically assessed EOLC knowledge among AMOs in Malaysia, which limits the opportunity for direct comparison. However, several studies from Western countries involving paramedics, similarly reported the low levels of EOLC knowledge.[17,18]

This study also revealed that participants with higher educational qualifications tended to have better knowledge of EOLC, a pattern consistent with findings from several other studies.[10,12,15,16,19] Participants with master's degree qualifications had the highest mean knowledge score. Similarly, a study from Spain also demonstrated a higher EOLC knowledge among physicians with postgraduate qualifications.[9] The emergency training in Malaysia lacks formal EOLC training, so higher scores may reflect greater experience or broader knowledge.

Variances in knowledge were also noted across age, gender, and years of experience. A study in Vietnam found older age and longer work experience were associated with good EOLC knowledge with no gender effect.[10] Similarly, a study conducted in Malaysia found that age and work experience influenced EOLC knowledge.[16] In addition, several other studies support this finding.[9,19,20] However, studies in Ethiopia found no relationship between these factors and EOLC knowledge.[15,21,22]

Participants with greater clinical experience, many of whom were doctors, demonstrated higher scores, possibly reflecting increased exposure to EOLC in the ED. Overall, HCWs in our study exhibited a generally positive attitude toward EOLC. Although, the attitude score was higher than in a previous Malaysian study among nurses, direct comparison is limited due to modification of the Likert scale. Other studies also showed similar findings.[10,15,21,23] The positive attitude toward EOLC among our HCWs, may reflect strong personal values, ethics, and professionalism as well as emphasis on patient-centered care and ethics in current medical education.

Physicians in our study demonstrated more positive attitudes toward EOLC compared to AMOs and nurses. This may relate to the differences in professional role expectations and clinical exposure rather than hierarchy. Nurses did not differ significantly from AMOs, suggesting that professional training and clinical exposure may influence attitudes more than hierarchical roles. In contrast, Al-Ansari *et al*. reported less favorable attitudes among emergency physicians in Kuwait, possibly due to dissatisfaction with EOLC integration. Notably, their study used a different instrument (Palliative Care Attitude and Knowledge Questionnaire), while ours used FATCOD and a modified PCKT.[11] A study conducted in Vietnam reflected a similar pattern to our findings, with physicians exhibiting more positive attitudes toward EOLC than nurses do.[10] Nurses showed a more positive attitude when compared to a previous Malaysian study, while a study among ED nurses in Indonesia reported scores like ours.[16,23] Interestingly, AMOs had a higher mean attitude score than nurses. While research on AMOs' or paramedics' attitudes toward EOLC remains limited, existing studies suggest that although paramedics recognize the importance of EOLC, they often report insufficient training, uncertainty, and lack of confidence in handling such situations.[17,18]

Our study found a significant association between higher education level and a more positive attitude toward EOLC, consistent with other studies.[15,16,22-24] However, studies from Ethiopia and Vietnam reported no such association.[10,13] These heterogeneous findings suggest that while training and education may improve attitudes, and other factors other factors such as HCW personalities, personal experiences, and belief also play important roles.

Moreover, this study found that male HCWs exhibited more positive attitudes toward EOLC than females. This contrasts with the findings of Bradley *et al*., where female physicians demonstrated better attitudes.[25] While some studies have suggested that gender-related social or ethical values may be linked to more positive attitudes, others have found no significant difference.[15,19,23] In our context, the observed gender disparity may be attributed to the higher proportion of female nurses, a group that generally reported lower attitude scores. This interpretation is further supported by our findings, which indicate that the apparent gender differences are more likely a reflection of professional role distribution rather than inherent gender-based dispositions.

The longer working experience was also associated with a more favorable attitude toward EOLC, consistent with various studies.[16,23] However, other studies reported no such association, suggesting that experience alone may not strongly influence attitudes.[10,13] The factors such as negative experiences with dying patients or personal experiences about death may contribute to the heterogeneity in findings.

This study demonstrated a misconception among HCWs that opioids cause addiction, consistent with previous findings from India.[20] A systematic review also reported similar concerns among doctors, nurses, medical students, and patients.[26] These misconceptions suggest that symptom management involving opioids in dying patients might be sub-optimized.

FATCOD B identified two domains: attitude toward caring for dying patients and patient-and-family centered care. Most of our HCWs agreed that caring for dying patients is worthwhile, with a higher percentage than in a previous study.[15] They believed they could support dying patients, in contrast to findings from a study in Ethiopia, where more than half of the participants disagreed with this view.[15] They also valued family involvement in care and support during the bereavement period. Despite a busy ED environment, our HCWs supported family presence at the end of life, aligning with studies in Ethiopia and South Korea.[21,27] In the Eastern culture, family presence at death is also seen as an important aspect of respectful passing.[27]

Limitations

This study has several limitations. The small sample size and single-center design may limit generalizability. Limited published research on EOLC knowledge and attitudes among Malaysian ED HCWs restricts direct comparisons. Data collection during the COVID-19 pandemic via online surveys may have introduced response bias and affected comprehension. In addition, the PCKT did not assess critical EOLC components such as communication skills and bereavement support. These limitations highlight the need for future multicenter studies with broader scope, improved data collection methods, and more comprehensive assessment tools to better evaluate EOLC knowledge and attitudes.

Conclusion

This study revealed that HCWs in the ED had limited knowledge but generally positive attitudes toward EOLC. A weak yet statistically significant correlation was identified between knowledge and attitude scores. The professional role, particularly being a doctor, significantly predicted more positive attitudes, while gender was not an independent factor. These findings underscore the need for targeted, profession-specific training to improve EOLC delivery in the emergency settings.

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Author contributions statement

MFMF: Conceptualization (equal); methodology (equal); writing -original draft (lead) and formal analysis (lead). SMJ: Conceptualization (equal); methodology (equal); writing -original draft (supporting), writing- review and editing (lead); supervision (lead). NANM: review and editing (supporting). MMMH: review and editing (supporting). AD: review analysis and editing (supporting)

Conflicts of interest

None Declared.

Ethical approval

This study was approved by Research Ethics Committee the at Universiti Kebangsaan Malaysia (Approval Number: UKM PPI/111/8/JEP-2021-620) on the 12th of August 2021.

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