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Original research article

Gender-specific differences in factors influencing attitude towards end-of-life care: a cross-sectional study among primary healthcare nurses

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Abstract
Background: Primary healthcare (PHC) nurses play a crucial role in delivering end-of-life care (EOLC). Exploring PHC nurses' attitudes towards EOLC based on gender is essential. This study aimed to examine attitudes toward EOLC through a gender-specific analysis among PHC nurses.
Methods: This cross-sectional study was conducted among PHC nurses in Jember, Indonesia. The sample size yielded 114 respondents. 45 male and 69 female PHC nurses were selected through simple random sampling. A demographic questionnaire and the Frommelt Attitudes Toward Care of the Dying Care Form B were utilized. Data analysis employed the Pearson correlation test, the chi-square test, Fisher's exact test, and linear regression.
Results: Across the entire PHC nurse sample, experience caring for end-of-life patients and experience attending EOLC training were significantly positive associated with attitudes toward EOLC ($p = 0.01$ and $p < 0.001$, respectively). In gender-specific analyses, experience attending EOLC training was the primary factor associated with more positive attitudes among male nurses ($p < 0.001$). Meanwhile, among female nurses, experience caring for the end-of-life patients was significantly associated with more positive attitudes toward EOLC ($p < 0.001$).
Conclusion: The gender-based analysis reveals substantial differences, underscoring the importance of gender-specific analysis in EOLC attitudes among PHC nurses. Distinct factors influence EOLC attitudes in male and female nurses. Further research is essential to develop gender-specific interventions to improve attitudes toward EOLC among PHC nurses.

Keywords: Attitude toward end-of-life care; FATCOD-B; Gender; Nurse; Primary healthcare

Introduction

End-of-life care (EOLC) is part of the palliative care framework that focuses on the needs of the final stages of life. EOLC can improve the quality of life for patients facing life-limiting illnesses. However, it remains a significant global challenge (Anorjan and Matchim; Pinto et al., 2024). Annually, 26 to 48 million people worldwide need palliative care, a key component of EOLC (Knaul et al., 2018; WHO, 2021). However, only about 14% of this need is met. The disparity is particularly evident in low- and middle-income countries, where more than half of the population lacks access to adequate care (Peeler et al., 2025).

In Indonesia, the challenges are even more pronounced. Although Indonesia already has palliative care support tools in the form of policies and hospital infrastructure that provide specific palliative services, there are still many challenges that arise, such as the limited funding, poor infrastructure, and lack of trained healthcare professionals (Chun Koh et al., 2025; Indarwati et al., 2019). In low-resource settings, especially in rural areas, EOLC implementation is often neglected despite its important role in maintaining palliative care continuity (Wilson et al., 2024). This underscores the importance of improving EOLC services to bridge the gap between the demand for care and its availability, especially in rural areas.

Nurses' attitudes are an important variable in efforts to improve EOLC services, which are influenced by several factors. Nurses play a vital role in ensuring that patients are as comfortable as possible in their final stages of life. In the context of specialized palliative care nurses in Poland, Jordan, and Ethiopia, it was found that attitudes towards EOLC are influenced by age, gender, work experience, and education level (Abate et al., 2019; Alhusamiah and Zeilani, 2025; Krężel et al.,

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2025). However, among nurses in Turkey and China, attitudes towards EOLC are not influenced by age, gender, work experience, or education level, but rather by nurses' experience in caring for end-of-life patients and in EOLC training (Bayram and Kiziltan, 2025; Zheng et al., 2025). The inconsistency of these results highlights gaps.

Furthermore, primary healthcare (PHC) nurses are essential to delivering EOLC, especially in areas with limited access to specialized palliative care (Mitchell et al., 2025). PHC nurses are an integral part of the EOLC implementation. In rural and underserved areas of Indonesia, where specialized palliative care services are scarce, primary healthcare nurses often provide the majority of EOLC (Bassah et al., 2023; Gagnon and Hébert, 2023). These nurses are tasked with addressing both the physical and emotional needs of patients, often with limited resources, to maintain continuity of care within the palliative care framework. Therefore, the attitude toward EOLC in the PHC nursing context warrants exploration.

Although gender remains a consistent predictor of attitudes towards EOLC, it continues to play a significant role in shaping EOLC implementation (Narayanan et al., 2025; Wong and Phillips, 2023). Studies show that female nurses are more likely to show empathy and engage in collaborative decision-making, while male nurses tend to focus more on technical tasks and may limit emotional involvement (Almagharbeh et al., 2025; Deng et al., 2023). Therefore, analyzing gender-specific groups to discover how this influences attitudes toward EOLC is important (Alshammari et al., 2023; Wong and Phillips, 2023). To the best of our knowledge, research on gender-specific attitudes toward EOLC, particularly among primary healthcare nurses, remains scarce.

This study addresses gender differences in attitudes toward EOLC using a gender analysis group among primary healthcare nurses in Indonesia. It examines how age, education, experience, and gender impact these attitudes. The research also explores each gender-based factor that can serve as a basis for gender-based interventions in EOLC implementation. The study aims to examine factors influencing attitudes towards EOLC among PHC nurses in Indonesia and to compare these by gender.

Materials and methods

Study design

This study employed a cross-sectional design. Cluster random sampling was used to examine factors influencing attitudes toward end-of-life care among primary healthcare nurses in Jember, with gender-specific analysis.

Setting and participants

This study was conducted in Jember District, in the eastern region of Java Island, Indonesia. The study population comprised all nurses at eight primary healthcare centers (PHCs) in Jember, representing the northern, southern, eastern, and western parts of the district. The total population was 803 nurses. These included 347 male and 456 female nurses who met the inclusion criteria: nurses working in inpatient care who had been employed at the primary healthcare center for at least one year.

The sampling calculation used G*power with an effect size of 0.15 (medium), an α error of 0.05, a power of 80%, and eight predictors. The sample size was 109, with a 10% dropout rate, resulting in 120 respondents (Faul et al., 2007). The ratio of male to female respondents was 51:69. Sampling was conducted using a cluster-randomized sampling technique based on a predetermined proportion of the eight PHCs. However, six male respondents did not complete the questionnaire because they were on leave during data collection, were unreachable, or were unwilling to participate. This resulted in 114 respondents, comprising 45 male and 69 female PHC nurses.

Data collection tools

Two questionnaires were administered to respondents: a demographic questionnaire covering marital status, religion, education level, work experience in PHC, experience caring for end-of-life patients, and experience in EOLC training. In this study, EOLC training was defined as any formal educational activity related to end-of-life care, such as workshops, seminars, in-service training, or continuing education programs. The second questionnaire is the FATCOD-B (The Frommelt Attitudes Toward Care of the Dying Care Form B). The FATCOD-B consists of 30 items rated on a five-point Likert scale. This instrument contains both positive and negative statements. Items 1, 2, 4, 16, 18, 20, 21, 22, 23, 24, 25, 27, and 30 are positive statements, while the rest are negative statements (Frommelt, 2003). Favorable statements are scored 1 for "strongly disagree" and 5 for "strongly agree", while unfavorable statements are scored 1 for "strongly agree" and 5 for "strongly disagree". The total score ranges from 30 to 150. Higher scores indicate more positive attitudes.

The Indonesian version of the FATCOD-B instrument has been tested for validity and reliability in previous research. Validity was tested using a Pearson correlation test, with results ranging from –0.278 to 0.544, indicating that all statement items in the Indonesian version of FATCOD-B are valid. Reliability testing for this instrument was conducted using Cronbach's alpha, yielding an alpha of 0.86. The range for each item was 0.651–0.713. If the α value is >0.60, the questionnaire is considered reliable (A'la et al., 2018).

Data collection procedure

Data collection was conducted between October and December 2024. Each respondent received an informed consent form and two questionnaires. The researcher provided instructions, and respondents completed the questionnaires themselves. The time required for respondents ranged from 20 to 40 minutes. The researcher ensured that all questionnaires were filled out.

Data analysis

Data were collected using a paper-based questionnaire and exported into an electronic dataset. The dataset was then reviewed for completeness, coding accuracy, and consistency before analysis. Data cleaning was performed to identify missing or inconsistent responses. Descriptive and statistical analyses were conducted using IBM SPSS Statistics version 26. To examine differences in respondent characteristics (marital status, religion, education level, work experience in PHC, experience in caring for end-of-life patients, and experience in EOLC training) between the two groups, the researcher used the chi-square test and the Fisher exact test.

Multiple regression analysis was used to examine the characteristics of respondents that influence attitudes toward EOLC. The researchers then analyzed the characteristics of respondents' attitudes toward EOLC in each group, namely men and women. Prior to regression modeling, the data met the basic assumptions of regression analysis: normal distribution, no multicollinearity, no heteroscedasticity, and no autocorrelation.

Ethical consideration

Ethical approval for this study was obtained from the Faculty of Nursing, Universitas Jember, under approval number 372/UN25.1.14/KEPK/2024. Participation was voluntary and informed consent was obtained before data collection. Anonymity was assured by not collecting names, employee identification numbers, phone numbers, email addresses, or other identifiable information. All responses were coded and analyzed in aggregate form.

Results

The characteristics of PHC nurses – including age, marital status, religion, education level, experience in caring for end-of-life patients, experience in EOLC training, and FATCOD-B score – were compared between male and female respondents. No significant differences were found between male and female nurses in age, marital status, religion, education level, experience in caring for end-of-life patients, or FATCOD-B score. However, experience in EOLC training differed between the two groups (p = 0.022). The detailed characteristics of respondents are presented in Table 1.

Multivariate linear regression was conducted to identify factors associated with attitudes toward EOLC among PHC nurses. The overall model was statistically significant, with an adjusted R-square of 0.193, F = 4.37, and p < 0.001, indicating that the model explained 19.3% of the variance in attitudes toward EOLC. Experience in caring for end-of-life patients (p = 0.01) and experience in EOLC training (p < 0.001) were significantly associated with more positive attitudes toward EOLC. The regression results for the overall sample are presented in Table 2.

Table 1. Characteristics of the participants and FATCOD-B score based on gender

Variable	Female (n = 69)	Male (n = 45)	P-value
	N (%)	N (%)	
Age (mean ± SD)	37.35 ± 7.22	36.31 ± 6.24	0.368[a]
Marital status			
Married	67 (97.1)	43 (95.6)	0.517[b]
Single	2 (2.9)	2 (4.4)	
Religion			
Islam	68 (98.6)	45 (100)	0.605[b]
Christian	1 (1.4)	0 (0)	
Education level			
Diploma	51 (73.9)	36 (80)	0.455[c]
Bachelor or higher	18 (26.1)	9 (20)	
Work experiences as a PHC nurse			
<10 years	21 (30.4)	21 (46.7)	0.079[c]
≥10 years	48 (69.6)	24 (53.3)	
Experience in caring for end-of-life patients			
Yes	47 (68.1)	34 (75.6)	0.392[c]
No	22 (31.9)	11 (24.4)	
Experience in EOLC training			
Yes	48 (69.5)	18 (40)	0.02*[c]
No	21 (30.5)	27 (60)	
FATCOD-B score (mean ± SD)	102.35 ± 6.61	102.24 ± 7.139	0.400[d]

Note: [a] Independent t-test; [b] Fisher's exact test; [c] the chi-square test; [d] Pearson correlation test; * statistically significant

Table 2. Regression analysis related to influencing factors of attitude toward EOLC among overall PHC nurses (n = 114)

Variables	B	SE	β	t	p	VIF
Constanta	122.68	8.82		13.92	<0.001*	
Gender (ref: Male)	1.36	1.24	0.09	1.09	0.28	1.13
Age	–0.16	0.10	–0.16	–1.58	0.12	1.54
Religion (ref: Islam)	–4.32	6.23	–0.06	–0.69	0.49	1.03
Marital status (ref: Married)	0.61	3.21	0.02	0.19	0.85	1.07
Education level (ref: Diploma)	–1.07	1.43	–0.07	–0.75	0.46	1.14
Work experience as a PHC nurse (ref: <10 years)	1.48	1.52	0.11	0.97	0.33	1.65
Experience in caring for end-of-life patients (ref: yes)	–3.76	1.32	–0.25	–2.85	0.01*	1.09
Experience in EOLC training (ref: yes)	–6.13	1.25	–0.45	–4.92	<0.001*	1.16

Note: ref: Reference category; * statistically significant

Further analysis was conducted separately by gender. The gender-specific regression results are presented in Table 3. Among male PHC nurses, the regression model was statistically significant, with an adjusted R-square of 0.582, F = 11.21, and p < 0.001. This finding indicates that the model explained 58.2% of the variance in attitudes toward EOLC among male nurses. Experience in EOLC training was significantly associated with more positive attitudes toward EOLC in this group (p < 0.001).

Table 3. A regression analysis of gender differences in factors influencing attitudes toward EOLC

Variables	Male (n = 45)						Female (n = 69)					
	B	SE	β	t	p	VIF	B	SE	β	t	p	VIF
Constanta	116.67	6.85		17.04	<0.001*		127.84	9.98		12.78	<0.001*	
Gender (ref: Male)	–0.23	0.14	–0.21	–1.67	0.10	1.57	–0.16	0.12	–0.17	–1.31	0.19	1.55
Religion (ref: Islam)							–1.92	6.03	–0.04	–0.32	0.75	1.04
Marital status (ref: Married)	1.58	3.58	0.07	0.72	0.48	1.15	–3.22	4.36	–0.08	–0.74	0.46	1.07
Education level (ref: Diploma)	3.22	1.81	0.182	1.78	0.08	1.10	–3.01	1.82	–0.20	–1.65	0.10	1.28
Work experience as a PHC nurse (ref: <10 years)	1.77	1.77	0.13	1.01	0.32	1.65	1.67	2.03	0.12	0.82	0.41	1.76
Experience in caring for end-of-life patient (ref: yes)	1.44	1.67	0.09	0.86	0.39	1.08	–6.92	1.61	–0.49	–4.29	<0.001*	1.13
Experience in EOLC training (ref: yes)	–10.64	1.45	–0.75	–7.36	<0.001*	1.06	–3.20	1.62	–0.23	–1.97	0.05	1.12

Note: ref: Reference category; * statistically significant

In the female PHC nurse group, the adjusted R-square was 0.214, F = 3.64, p = 0.002. These results indicate that the model fits and can explain 21.4% of the variance in attitudes toward EOLC. Furthermore, the variable experience in caring for end-of-life patient is significantly associated with attitudes toward EOLC among female PHC nurses (p < 0.001).

Discussion

This study aimed to investigate gender-specific differences in factors influencing attitudes towards end-of-life care among primary healthcare nurses. Our findings reveal important distinctions in the predictors of EOLC attitudes between male and female nurses, despite a general lack of significant demographic differences between the genders.

Consistent with the existing literature, our study found that, overall, PHC nurses' prior EOLC training and direct experience caring for patients at the end of life significantly influenced their attitudes towards EOLC. These findings align with previous research highlighting the crucial roles of education and practical experience in shaping nurses' EOLC perspectives (Zheng et al., 2025). Studies have consistently shown that palliative care training is a key factor in improving EOLC attitudes (Natuhwera et al., 2025; Zheng et al., 2025) and can lead to significant increases in positive attitudes towards dying patients (Hao et al., 2021). Similarly, direct exposure to patients at the end of life provides valuable experience that shapes attitudes, fostering a sense of preparedness among healthcare professionals (Hingley et al., 2024).

A novel aspect of our findings is the gender-specific factors that predict EOLC attitudes. For male PHC nurses, EOLC training emerged as the sole significant predictor, accounting for 58.2% of the variance in their attitudes. This suggests that formal education and training programs are particularly effective in developing positive EOLC attitudes among male nurses, a finding supported by research highlighting the importance of targeted training in shaping attitudes (Zheng et al., 2025). Conversely, for female PHC nurses, the experience of having cared for end-of-life patients was the primary predictor of EOLC attitudes, accounting for 21.4% of the variance. This highlights the profound impact of direct patient care experiences on female nurses' EOLC attitudes, possibly reflecting a greater emphasis on empathy and emotional engagement derived from these experiences (Liu and De Ala, 2025). While our study did not find significant gender differences in most demographic characteristics, including general EOLC experience, the differential impact of specific EOLC training versus direct patient care experience on male and female nurses' attitudes warrants further exploration.

The observed gender-specific associations in our study resonate with broader, albeit sometimes conflicting, discussions in the literature regarding nurses' attitudes toward EOLC. While some studies suggest no significant gender differences in attitudes (Daniel et al., 2024), others indicate that female nurses may express more positive attitudes towards caring for the dying, potentially due to heightened compassion and empathy (Ashrafizadeh et al., 2022; Daniel et al., 2024) Conversely, some research points to male nurses exhibiting more positive attitudes or higher levels of palliative care knowledge (Altarawneh et al., 2023). These variations could stem from differing social roles, emotional coping mechanisms, or even varying levels of death anxiety between genders (Daniel et al., 2024; Hingley et al., 2024). For instance, male nurses might under-report death anxiety due to societal expectations of being a protector (Hingley et al., 2024). This complexity underscores the need to consider gender-specific factors when developing educational programs and support systems to enhance EOLC attitudes and practices (Liu and De Ala, 2025).

The differing explanatory power of the models (58.2% for males vs. 21.4% for females) suggests that while EOLC training is a strong predictor for male PHC nurses, the factors influencing female nurses' attitudes are more complex and may involve additional variables not captured in this study. It indicates that gender-specific approaches to EOLC education and support may be beneficial (Liu and De Ala, 2025). Recognizing these distinct influences is critical for developing targeted interventions to enhance EOLC attitudes across the nursing

workforce, ultimately improving the quality of care provided to dying patients and their families, especially in rural areas and community settings.

This study provides valuable insights into gender-specific factors influencing EOLC attitudes among primary healthcare nurses, a population that is often at the forefront of palliative care delivery. By using a robust statistical approach, such as multivariate linear regression, the study identified significant predictors and quantified the variance explained by these factors, contributing to a nuanced understanding of a complex issue. The focus on both male and female nurses allows for a more comprehensive analysis than studies focusing on a single gender. However, while it offers valuable insights, this study is subject to limitations inherent in its cross-sectional design, which preclude causal inference. The self-reported nature of the data may introduce recall or social desirability bias, potentially affecting the accuracy of reported attitudes and experiences.

In addition, the findings should be interpreted within the cultural and religious context of Indonesia, where family involvement, respect for modesty, and spiritual needs are important aspects of end-of-life care. In the PHC setting, nurses generally provide EOLC based on patient needs, professional responsibility, and staff availability, rather than exclusively according to the gender of the patient or nurse (Savard et al., 2025). However, when intimate care is required, patient comfort, family preference, and cultural or religious values may be considered, and same-gender care may be arranged when feasible. The findings are also specific to primary healthcare nurses, which may limit their generalizability to other nursing populations or healthcare settings.

Conclusion

This study reveals that while both clinical experience and training improve end-of-life care attitudes among primary healthcare nurses, the primary drivers are gender-specific: training for males and direct patient experience for females. These findings offer practical benefits by enabling the development of targeted, gender-sensitive educational interventions that move beyond one-size-fits-all approaches to palliative care capacity-building. Future research should focus on designing and evaluating the effectiveness of such gender-based training modules to optimize end-of-life care delivery in primary health settings.

Authors' contributions

MZA contributed to the conceptualization and design of the study and manuscript writing. *FEM*, *KK* and *YW* contributed to data collection and data analysis. *IAS*, *FNQ*, and *RR* contributed to the finalization of the manuscript.

Ethical consideration

This study received ethical clearance from the Faculty of Nursing, Universitas Jember (Approval Number: 372/UN25.1.14/KEPK/2024; Date: November 9, 2024).

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Informed consent

Written informed consent was obtained from all participants enrolled in this study.

Availability of data and materials

The data used in this study are available from the corresponding author upon reasonable request.

Conflict of interest

The authors have no conflict of interest to declare.

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