Research Square

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The paradoxical impact of death education on nurses' death attitudes: A nationwide latent profile analysis

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Abstract

Background: Nurse' attitudes toward death profoundly influence the quality of palliative care and their own psychological resilience. Although existing research often treats death attitudes as a homogeneous construct, evidence regarding the latent heterogeneity within this population and how multi-level factors predict these complex attitudes remains scarce.

Objectives: To identify latent profiles of death attitudes among Chinese clinical nurses and determine the individual, occupational, and experiential factors predicting these profiles within a death-taboo cultural context.

Design: A multicenter, cross-sectional survey design.

Settings and Participants: A nationwide sample comprising 5448 registered clinical nurses across 11 cities in China.

Methods: We measured death attitudes using the Death Attitude Profile-Revised (DAP-R). Latent Profile Analysis (LPA) identified unobserved subgroups. Hierarchical Linear regression examined predictors of death attitude dimensions across three blocks: Hierarchical Linear Regression was used to examine predictors of death attitude dimensions across three blocks: individual factors (Block 1), occupational factors (Block 2), and death-related experiences (Block 3). LPA was utilized to identify unobserved subgroups based on the five dimensions of the DAP-R. Multinomial logistic regression further identified predictors of profile membership.

Results: LPA extracted three distinct typologies: Profile 1 (“Ambivalent-Intense”, characterized by high fear and compensatory acceptance, lacking neutral acceptance), Profile 2 (“Detached Coping”, exhibiting severe emotional blunting across all dimensions), and Profile 3 (“Normative-Balanced”, representing the pragmatic baseline). Hierarchical regression identified unmarried or divorced status as a consistent predictor of maladaptive coping. Crucially, multinomial logistic regression revealed the paradoxical impact of systematic death education. Compared to the normative Profile 3, high exposure to systematic death education significantly increased the odds of belonging to the emotionally blunted Profile 1 (OR = 1.42, 95% CI: 1.20–1.67, $p<0.001$) and strongly predicted membership in the highly conflicted Profile 2 (OR = 2.54, 95% CI: 2.09–3.08, $p<0.001$).

Conclusions: Clinical nurses process patient mortality through a complex, heterogeneous spectrum of emotional labor. Systematic death education does not uniformly eradicate death fear; rather, without concurrent structured psychological debriefing, it inadvertently precipitates severe defensive emotional blunting or intense cognitive dissonance. To safeguard the nursing workforce, healthcare systems must dismantle "one-size-fits-all" training paradigms and implement precision-targeted psychological support mechanisms.

What is already known

- Continuous exposure to patient mortality places clinical nurses at high risk for moral distress, compassion fatigue, and professional burnout.
- Existing research predominantly relies on variable-centered approaches, assuming a simple, linear transition from death fear to death acceptance.
- Conventional paradigms presume systematic death education functions as a universal protective intervention that uniformly mitigates death anxiety and cultivates healthy coping mechanisms.

What this paper adds

- Extracts three distinct latent profiles of death attitudes among 5448 clinical nurses, revealing that highly engaged professionals deploy paradoxical "compensatory coping" to navigate intense moral distress.
- Challenges traditional educational assumptions by demonstrating that systematic death education inadvertently precipitates severe emotional blunting (OR =2.54) and intense cognitive dissonance (OR = 1.42) when delivered without psychological support.
- Highlights the critical need for a paradigm shift from universal training to precision-targeted interventions, emphasizing the integration of institutionalized psychological debriefing into end-of-life curricula.

1. Introduction

Nurses serve as the primary witnesses to human mortality in healthcare settings. With the global aging population and the increasing medicalization of end-of-life care, clinical nurses are exposed to unprecedented levels of patient suffering and death. This continuous exposure demands immense emotional labor. When nurses fail to process the existential trauma associated with patient mortality, [1] they face a significantly heightened risk for moral distress, [2] compassion fatigue, and subsequent professional burnout. [3, 4] Furthermore, topics related to death are often avoided in daily life, and talking about death is considered an unlucky behavior due to cultural taboos in China. [5] What’s more, in the Chinese socio-cultural context, end-of-life care is deeply intertwined with traditional Confucian philosophies, particularly filial piety (Xiao) and benevolence (Ren). These cultural imperatives obligate caregivers to prioritize the preservation of life and the alleviation of suffering, often creating profound internal conflicts when a patient's death becomes inevitable. [6]

Therefore, those sociocultural background also exacerbate the psychological burden and fear of death on nurses, [7] who frequently lack adequate social support. Consequently, understanding nurses' death attitudes—defined as their evaluative and emotional responses to mortality [8]—has become a critical imperative for sustaining the global nursing workforce and ensuring the quality of palliative care.

Although existing studies reveal various factors that influence Chinese nurses’ attitudes toward death, [9–12] most rely on traditional variable-centered methods. These approaches typically examine the linear

correlations between isolated dimensions of death attitudes (e.g., fear, avoidance, or acceptance) and psychological outcomes.

Moreover, existing literature frequently portrays nurses as passive recipients of cultural norms and taboos about death, largely overlooking their active agency in negotiating and integrating diverse socio-cultural values into end-of-life care. While qualitative studies have explored these nuanced emotional struggles, large-scale quantitative research historically fails to capture this dynamic complexity. [13, 14]

Variable-centered approaches average out the data, failing to capture how conflicting attitudes can co-occur within the same individual. [15] For instance, a highly empathetic nurse might exercise her agency by simultaneously holding a profound human fear of death while cognitively accepting it as a necessary release from patient suffering. Capturing this complex emotional heterogeneity requires a person-centered approach, such as Latent Profile Analysis (LPA). LPA identifies unobserved, naturally occurring subgroups based on the intersection of multiple attitude dimensions, providing a clinically actionable understanding of nurses' psychological states. [16]

Furthermore, a prevailing dogma in nursing management posits that death education is universally beneficial. [17] Conventional wisdom assumes a linear dose-response relationship: more education leads reduce death anxiety and increases “neutral acceptance”. [18] However, empirical evidence remains surprisingly mixed, with some studies reporting that end-of-life training occasionally exacerbates nurses' psychological distress. [19] We hypothesize that exposing nurses to the harsh realities of mortality through education—without providing adequate psychological scaffolding—might act as a "double-edged sword," inadvertently triggering defensive emotional blunting rather than healthy coping. Yet, large-scale empirical evidence exploring how systematic education predicts specific typologies of death attitudes remains scarce.

To address these critical knowledge gaps, this study utilized a massive, nationwide sample of clinical nurses in China. The primary objectives were twofold: (1) to identify the latent profiles of death attitudes among clinical nurses using a person-centered approach (LPA), and (2) to determine how socio-demographic vulnerabilities (e.g., marital status) and exposure to systematic death education predict profile membership. By deconstructing the spectrum of emotional labor, this study aims to provide robust empirical evidence to guide precision-targeted psychological interventions and reform continuing education policies.

2. Methods

2.1 Study design

This research employed a multicenter, cross-sectional, nationwide survey design, which conducted in 11 cities, China, known as the Nurse Death Education Study (NDES2026). Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines was used. (Appendix 1) [20]

2.2 Participants

We collected data from registered nurses with convenience sampling. Eligible participants were registered nurses currently providing direct patient care in clinical or community settings with at least six months of experience, who voluntarily provided informed consent. Nurses on extended leave during data collection, as well as student nurses and interns, were excluded, with no restrictions based on clinical department or seniority to ensure maximum sample diversity.

Participants were recruited through a multilevel administrative distribution process, where invitation letters containing the survey link were cascaded from provincial nursing associations to hospital administrators, who then forwarded them to eligible nurses via internal communication channels. The selection of healthcare organizations was carefully made in consultation with key contact people, typically nursing department heads or hospital administrators, to target a broad range of clinical settings. This approach aimed to enrich the sample with perspectives from nurses working across diverse healthcare sectors—from primary care to specialized and acute care environments, thereby providing a comprehensive view of the target population and enhancing the representativeness of the findings.

Sample size estimation was guided by methodological recommendations for both regression analysis and LPA. For the regression component, a conservative guideline of up to 30 cases per predictor is recommended when aiming to detect small effects. [21] Based on this, the 17 predictors planned for the main analysis required a minimum of 510 complete responses. For LPA, recommendations indicate that samples exceeding 500 are generally adequate, particularly with a moderate number of indicators. [22, 23] The final sample of 5448 registered nurses substantially exceeded both benchmarks, providing exceptional statistical power (> 0.99) to detect small effect sizes and identify subtle latent subgroups. The significant sample size across multiple tiers of the healthcare system ensures that the identified profiles are robust and representative of nurses working in varied clinical and socioeconomic contexts in China.

2.3 Instruments

Participants completed an online questionnaire comprising three components. The self-developed demographic section collected 17 personal, occupational and death-related experience items, which was pilot-tested on 50 nurses, achieving a content validity index of 0.82. Death attitudes were measured using the Chinese version of the Death Attitude Profile-Revised (DAP-R), a 32-item scale assessing five dimensions: fear of death, death avoidance, neutral acceptance, approach acceptance, and escape acceptance. A complementary 10-item scale evaluated death education needs. Both scales demonstrated excellent reliability (Cronbach's $\alpha = 0.936$ and 0.967, respectively).

2.4 Recruitment and Settings

A dual-track recruitment strategy ensured geographical and socioeconomic diversity. Primary recruitment was conducted through the Gansu Provincial Nursing Association, which disseminated the

study invitation and encrypted survey link by its administrative network to nursing department heads at member hospitals for distribution to frontline nurses. Automated reminders issued over two weeks to minimize non-response bias. Secondary recruitment extended the survey by professional networks to registered nurses across 11 additional provinces in Northern, Central, and Eastern China, intentionally capturing a broad spectrum of clinical settings from urban tertiary teaching hospitals to rural community centers, thereby strengthening the sample's national representativeness.

2.5 Data Analysis

We analyzed data using IBM SPSS (v27.0) and R (v4.3.0). Descriptive statistics summarize sample characteristics and variable distributions. Continuous variables, including the five DAP-R sub-dimensions and composite indices (e.g., death education demand), were reported as means with standard deviations (SD). Categorical data were reported as frequencies and percentages. To allow for group comparisons in regression models, multi-categorical variables were dummy-coded. We used the Kolmogorov-Smirnov test to assess the normality of continuous variables. We also visually inspected histograms and Q-Q plots to check for major deviations from normality. Because the Kolmogorov-Smirnov test is overly sensitive in large samples, we prioritized these graphical assessments. Cronbach's alpha was used to measure internal consistency.

A total of 5505 nurses participated in the survey. During the data cleaning process, 57 cases (1.04%) were excluded due to missing data on key variables or illogical responses (e.g., anomalous age entries). Given that the proportion of missing data was negligible (< 5%), we employed complete case analysis (listwise deletion). Consequently, the final effective sample size utilized for the Latent Profile Analysis (LPA) and subsequent regression models was 5448.

2.5.1 Univariate Linear Regressions

Univariate linear regression was used for initial variable screening. Each potential predictor was tested separately against the five death attitude dimensions. Variables meeting a significance threshold of $p < 0.05$ were selected. These significant variables were then entered into hierarchical linear regression models in three sequential blocks.

2.5.2 Hierarchical Regression

We performed hierarchical linear regression for each death attitude dimension. This approach controlled for confounders and identified the incremental predictive power of different variable groups.

In the first block (Block 1), individual-level variables (e.g., age, gender, marital status) were entered to control for personal backgrounds. Block 2 added occupational factors (e.g., professional title, nursing experience) to account for professional and organizational characteristics. Block 3 incorporated death-related experiences (e.g., bereavement history, death education exposure, perceived educational demand) to evaluate their additional predictive value. Specifically, for each of the five death attitude dimensions, we performed a second-stage hierarchical regression. To ensure model parsimony, we only

included predictors that explained at least 1% of the variance (Partial Eta^2 ≥ 0.01). This strategy kept the final models simple while retaining meaningful predictors.

We reported unstandardized (B) and standardized regression coefficients (β), 95% confidence intervals (CIs), p-values, and and partial eta squared (η2) for each model. We assessed incremental explanatory power using the coefficient of determination (R^2), the change in between blocks (ΔR^2), the Akaike Information Criterion (AIC), and F-tests for model comparisons. Multicollinearity was checked using the Variance Inflation Factor (VIF), with values under 5 considered acceptable. We evaluated residual homoscedasticity, linearity, and normality using graphical and statistical methods. Statistical significance was set at $p < 0.05$.

2.5.3 Latent Profile Analysis

We used Latent Profile Analysis (LPA) to explore the heterogeneity of nurses' death attitudes from a person-centered perspective. We estimated models with 1 to 4 classes based on the five DAP-R dimensions using the tidyLPA and mclust packages in R (version 4.3.0).

To ensure model stability given the large sample size, we constrained variances to be equal across classes and fixed covariances at zero. We selected the optimal model based on the lowest Information Criteria (AIC, BIC, and SABIC). BIC and SABIC are particularly robust indicators for LPA in large samples. [24] Finally, we used Entropy to evaluate classification precision.

After assigning participants to latent classes, we used multinomial logistic regression to identify predictors of profile membership. To assess training depth, we constructed a composite variable named "Death Education Exposure." We categorized this variable into three levels based on course frequency and systematicity: High (systematic courses or 3 sessions), Moderate (fragmented or 1–2 sessions), and None (no experience). We included this composite variable, alongside individual and occupational factors, in the regression model. We set the most adaptive profile (Profile 3: "Normative-Balanced") as the reference group. Finally, we reported the results as adjusted Odds Ratios (aORs) with 95% Confidence Intervals (CIs).

2.6 Ethical Considerations

This study was conducted in accordance with the principles of the Declaration of Helsinki. The research protocol was approved by the Ethics Committee of the School of Nursing, Lanzhou University, China (approval No. LZUHLXY20250198).

3. Results

3.1 Characteristics of participants

A total of 5448 nurses from multiple Chinese hospitals participated in this multicenter cross-sectional study (Table 1). The sample was predominantly female (96.36%, n = 5304), with a mean age of 35.32

years (SD = 10.09, range = 19–63). Most participants held a bachelor's degree (75.58%, n = 4122), were married (80.38%, n = 4379), and worked as supervisor nurses (38.01%, n = 2071). Participants had an average of 12.00 years as a nurse (range = 6 months–36 years) and 7.13 years of experience in their current ward (SD = 0.76, range = 6 months–36 years).

Table 1
Demographic and Professional Characteristics

Variable	Category	N	Mean (SD) or percent
Gender	Male	144	2.64%
	Female	5304	97.36%
Age (years) mean ± SD, range	Continuous	5448	35.32 ± 10.09, 19 ~ 63
Education	Secondary Technical School or Below	51	0.94%
	Junior College	1265	23.35%
	Bachelor's Degree	4122	76.58%
	Master's Degree	8	0.15%
	Doctoral Degree	2	0.04%
Marital status	Unmarried	981	18.01%
	Married	4379	80.38%
	Divorced/Widowed	83	1.52%
	Other	5	0.09%
Professional title	Nurse	868	15.93%
	Nurse Practitioner	2013	36.95%
	Supervisor Nurse	2071	38.01%
	Deputy Director Nurse	449	8.24%
	Director Nurse	47	0.86%
Current Department/ward	Oncology Department	446	8.17%
	Emergency Department	482	8.83%
	ICU (Intensive Care Unit)	312	5.71%
	Palliative Care/Hospice Ward	19	0.37%
	Geriatrics Department	245	4.48%
	Cardiology/Respiratory Medicine or Other Chronic Disease	639	11.71%

Legend: N, Number; SD, standard deviation.

Variable	Category	N	Mean (SD) or percent
	Operating Room	354	6.48%
	General Ward	1007	18.30%
	Other	1969	35.96%
Years as a nurse, mean ± SD, range	Continuous	5448	12.00 ± 0.10, 6 mouth ~ 40
Years in the current ward, mean ± SD, range	Continuous	5448	7.13 ± 0.76, 6 mouth ~ 36
The frequency of directly caring for terminally ill patients or handling patient death events	Never experienced	1968	35.96%
	Rarely (1–5 times)	2667	48.95%
	Sometimes (6–15 times)	572	10.50%
	Frequently (16 times or more)	241	4.42%
Personal bereavement experience in the past three years	Yes	1099	20.17%
	No	4349	79.83%
Participated in death education-related courses	Yes, and the content was systematic	1116	20.48%
	Yes, but the content was scattered	1940	35.61%
	No, never studied	2392	43.91%
Participated in death education-related lectures, workshops, or training (including online)	Yes, 3 times or more	623	11.44%
	Yes, 1–2 times	1827	33.54%
	No, never participated	2998	55.03%
Self-Assessed coping ability	Extremely confident	599	10.99%
	Relatively confident	1417	26.01%
	Average	2549	46.79%
	Lacking confidence	667	12.24%
	Almost no confidence	216	3.96%
Legend: N, Number; SD, standard deviation.			

Variable	Category	N	Mean (SD) or percent
Perceived need for death education among nurses	Very necessary	1760	32.31%
	Necessary	2850	52.31%
	Unsure	579	10.63%
	Not necessary	192	3.52%
	Not necessary at all	67	1.23%
Family communication about death	Never	1241	22.78%
	Openly	1676	30.76%
	Avoid	2531	46.46%
Experience with End-of-Life Care	Yes	2407	44.18%
	No	3041	55.82%
Reading books or article about death	Yes	2187	40.14%
	No	3261	59.86%
Legend: N, Number; SD, standard deviation.			

Regarding death-related experiences, 35.96% (n = 1968) of nurses reported no prior exposure to patient deaths, while 48.95% (n = 2667) reported rare encounters (1–5 times). Recent family bereavement affected 20.17% (n = 1099) of the sample. Participation in death education was limited: 43.91% (n = 2392) had never taken related courses, and 56.09% (n = 3056) lacked formal training. Furthermore, 46.79% (n = 2549) rated their coping skills as average. Over half of the participants (52.31%, n = 2850) considered death education necessary. Many nurses avoided discussing death with family (46.46%, n = 2531). Less than half reported having end-of-life care experience (44.18%, n = 2408) or reading death-related literature (40.14%, n = 2187).

The DAP-R scale demonstrated excellent internal consistency (Cronbach's = 0.91–0.96 across five subscales). The mean total score was 94.43 (SD = 9.30, SE = 0.13), indicating an overall positive attitude toward death (Appendix 2). Among the five subscales, approach acceptance scored the highest (mean = 28.67, SD = 7.80), while neutral acceptance scored the lowest (mean = 10.51, SD = 3.51). Mean scores for the other subscales were 20.58 (SD = 6.20) for escape acceptance, 17.95 (SD = 5.36) for fear of death, and 16.73 (SD = 4.43) for death avoidance. Standard errors across all dimensions were small (0.047–0.105), reflecting precise mean estimates due to the large sample size. Finally, the death education needs scale indicated a high demand (mean = 2.10), particularly for understanding death (mean = 1.97) and emotional coping (mean = 2.01).

3.2 Hierarchical Regression Analyses

Hierarchical regression analyses were conducted to examine the independent contributions of individual-level variables (Model 1), occupational factors (Model 2), and death-related experiences factors (Model 3) to each of the five death attitude dimensions. We reported the R^2, ΔR^2, and regression coefficients for each model.

3.2.1 Death Fear and Death Avoidance

Univariate analyses identified several significant correlates of death fear: marital status, clinical ward, years in the current ward, participation in death education lectures, self-assessed coping ability, perceived need for death education, and reading death-related literature (Appendix 3). We subsequently entered these variables into the hierarchical model.

Individual factors (Model 1) explained 1.0% of variance in death fear ($R^2 = 0.010$). Adding occupational factors (Model 2) significantly increased explained variance ($\Delta R^2 = 0.010$, $p < 0.001$). Death-related experiences (Model 3) contributed the largest increment ($\Delta R^2 = 0.022$, $p < 0.001$). The final model explained 2.5% of the total variance (Table 2). In the fully adjusted model, unmarried status remained a strong risk factor (B = 0.222, $p < 0.001$). Conversely, participation in death education lectures (B = − 0.083, $p < 0.001$) and perceived need for death education (B = − 0.078, $p < 0.001$) emerged as protective factors. Interestingly, higher self-assessed coping ability and reading death-related literature predicted increased fear.

Table 2
Hierarchical regression on *Death fear* with statistically significant factors at the univariate regression

Variables	Model 1 B (95% CI)		Model 2 B (95% CI)		Model 3 B (95% CI)	
	B(95%CI)	Partial Eta2	B(95%CI)	Partial Eta2	B(95%CI)	Partial Eta2
Model 1 Individual factors						
Marital Status (Ref: Married)						
Marital Status: Unmarried vs married	-0.222 (-0.283, -0.160)***	-0.095				
Marital Status: Divorced/Widowed vs married	-0.251(-0.446, -0.057)*	-0.034				
Marital Status: Others vs married	0.031(-0.750, 0.811)	0.001				
Model 2 Individual factors Occupational factors						
Marital Status (Ref: Married)						
Marital Status: Unmarried vs married			-0.213(-0.279, -0.148)***	-0.086		
Marital Status: Divorced/Widowed vs married			-0.251(-0.446, -0.057)*	-0.034		
Marital Status: Others vs married			0.033(-0.747, 0.814)	0.001		
Current Department/ward (Ref: Oncology)						
Emergency Department VS Oncology Department			-0.081(-0.198, 0.036)	-0.005		
ICU (Intensive Care Unit) VS Oncology Department			0.417(0.023, 0.812)	-0.018		

Variables	Model 1 B (95% CI)		Model 2 B (95% CI)		Model 3 B (95% CI)	
	B(95%CI)	Partial Eta2	B(95%CI)	Partial Eta2	B(95%CI)	Partial Eta2
Model 1 Individual factors						
Palliative Care VS Oncology Department			-0.003(-0.125, 0.119)	0.028		
Geriatrics VS Oncology Department			0.050(-0.033, 0.133)	-0.001		
Operating Room VS Oncology Department				0.016		
General Ward VS Oncology Department			0.061(-0.044, 0.166)	0.015		
Others VS Oncology Department			0.072(-0.003, 0.147)	0.025		
Years in the current ward			0.002(-0.003, 0.006)	0.009		
Model 3 Individual factors□Occupational factors□Death-related Experiences						
Marital Status (Ref: Married)						
Marital Status: Unmarried vs married					-0.222 (-0.283, -0.160)***	-0.090
Marital Status: Divorced/Widowed vs married					-0.251(-0.446, -0.057)*	-0.031
Marital Status: Others vs married					0.031(-0.750, 0.811)	0.001
Current Department/ward (Ref: Oncology)						
Emergency Department VS Oncology Department					-0.081(-0.198, 0.036)	0.002

Variables	Model 1 B (95% CI)		Model 2 B (95% CI)		Model 3 B (95% CI)	
	B(95%CI)	Partial Eta2	B(95%CI)	Partial Eta2	B(95%CI)	Partial Eta2
Model 1 Individual factors						
ICU (Intensive Care Unit) VS Oncology Department					0.417(0.023, 0.812)	-0.017
Palliative Care VS Oncology Department					-0.003(-0.125, 0.119)	0.028
Geriatrics VS Oncology Department					0.050(-0.033, 0.133)	0.001
Operating Room VS Oncology Department						0.020
General Ward VS Oncology Department					0.061(-0.044, 0.166)	0.014
Others VS Oncology Department					0.072(-0.003, 0.147)	0.020
Years in the current ward					0.002(-0.003, 0.006)	0.016
Participated in death education-related lectures, workshops, or training					-0.083(-0.122, -0.044)***	-0.056
Self-Assessed coping ability					0.079(0.051, 0.107)***	0.074
Perceived need for death education among nurses					-0.078(-0.109, -0.048)***	-0.068
Reading books or article about death					0.107(0.055, 0.158)***	0.054
Model Fit Statistics						
R	0.099		0.109		0.158	
R^2	0.01		0.012		0.025	

Variables	Model 1 B (95% CI)		Model 2 B (95% CI)		Model 3 B (95% CI)	
	B(95%CI)	Partial Eta2	B(95%CI)	Partial Eta2	B(95%CI)	Partial Eta2
Model 1 Individual factors						
ΔR^2(Delta R-Squared)	0.009		0.01		0.022	
F test for R^2 change	18.158***		1.299***		18.310***	

For Death Avoidance (Appendix 4), the hierarchical regression followed a similar pattern. Individual factors accounted for 1.0% of variance. Occupational factors added a modest increment ($\Delta R^2 = 0.010$), and death-related experiences provided the greatest contribution ($\Delta R^2 = 0.022$). The final model explained 2.5% of the variance. Regarding marital status, unmarried and divorced/widowed nurses exhibited significantly higher avoidance (B = 0.241 and 0.393, respectively, both $p < 0.001$). Nurses in the Emergency Department reported lower avoidance (B = − 0.123, $p < 0.05$). Furthermore, death education participation (B = 0.064, $p < 0.001$) and reading death-related materials (B = − 0.106, $p < 0.001$) served as protective factors against avoidance.

3.2.2 Neutral Acceptance

For neutral acceptance (Appendix 5), the hierarchical model demonstrated the highest total explanatory power ($R^2 = 0.057$). Occupational factors contributed an increment of 1.5% ($\Delta R^2 = 0.015$), and death-related experiences added further explanatory power ($\Delta R^2 = 0.054$). Regarding occupational factors, education level significantly predicted neutral acceptance; specifically, holding a Junior College degree (vs. Bachelor's) was a positive predictor (B = 0.073, $p < 0.01$). Conversely, holding a director Nurse title (vs. Supervisor Nurse) was a negative predictor (B = − 0.217, $p < 0.01$). Furthermore, death-related experience variables—including coping ability, perceived need for education, and reading death-related literature—showed significant positive associations with neutral acceptance.

3.2.3 Approach Acceptance and Escape Acceptance

For approach acceptance (Appendix 6), occupational factors ($\Delta R^2 = 0.011$) and death-related experiences ($\Delta R^2 = 0.020$) significantly improved model fit, with the final model explaining 2.3% of the variance. Unmarried status (B = 0.144) and holding a Deputy Director title (B = 0.207) were positive predictors. In contrast, lower professional titles, including Nurse (B = − 0.199, $p < 0.001$) and Nurse Practitioner (B = − 0.182, $p < 0.001$), as well as years in the current ward (B = − 0.005, $p < 0.05$), were negatively associated with this dimension. Additionally, death-related factors such as personal bereavement, education participation, and end-of-life care experience positively predicted approach acceptance.

For escape acceptance (Appendix 7), the hierarchical models explained 1.8% of the total variance, with occupational factors ($\Delta R^2 = 0.012$) and death-related experiences ($\Delta R^2 = 0.016$) providing incremental contributions. Older age (B = − 0.013, $p < 0.05$) and unmarried status (B = − 0.138, $p < 0.001$) were associated with lower scores. Professional titles demonstrated a clear gradient effect: lower titles (Nurse: B = 0.136, $p < 0.01$; Nurse Practitioner: B = 0.086, $p < 0.01$) positively predicted escape acceptance, whereas higher titles (Deputy Director: B = − 0.245, $p < 0.001$; Director: B = − 0.447, $p < 0.01$) negatively predicted it. Moreover, total years as a nurse (B = 0.006, $p < 0.05$) and years in the current ward (B = 0.013, $p < 0.01$) showed positive associations. Among death-related factors, personal bereavement experience and perceived need for education emerged as negative predictors.

4. Discussion

4.1 Key Findings and Interpretations

To our knowledge, this is the first large-scale multicenter study to disentangle the heterogeneity of death attitudes among Chinese clinical nurses using a person-centered approach. Our findings challenge the traditional linear paradigm, which often assumes that increased clinical experience or death education uniformly decreases death fear. Instead, our Latent Profile Analysis (LPA) reveals that clinical nurses' death attitudes manifest in three distinct, complex typologies: "Ambivalent-Intense" (Profile 1), “Detached Coping” (Profile 2), and "Normative-Balanced" (Profile 3). Crucially, we uncovered a paradoxical effect: high exposure to systematic death education does not necessarily eradicate the fear of death; rather, it significantly increases the risk of nurses adopting maladaptive coping profiles. This highlights an urgent need for targeted, profile-specific educational and psychological interventions in nursing management.

4.1.1 The Burden of Empathy and Emotional Blunting

The specific configurations of the two maladaptive profiles offer a compelling theoretical breakthrough. Profile 1 ("Ambivalent-Intense") uniquely combined high fear and avoidance with elevated approach and escape acceptance. This paradoxical configuration explains their lack of objective "neutrality." Because modern end-of-life care often entails intense, medicalized patient suffering—particularly in intensive care and oncology settings—nurses struggle to view mortality with calm neutrality without incurring moral distress [25–27]. Consequently, Profile 1 nurses process death not as a natural biological event, but as an emotionally charged crisis.

To navigate this crisis, Profile 1 nurses deploy profound "compensatory coping." While they harbor an instinctual terror of death, their professional duty and empathy compel them to cognitively reframe mortality to sustain compassionate care. A foundational qualitative meta-synthesis [14], corroborated by recent empirical studies [28, 29], confirms that clinical nurses frequently rationalize patient death as a release from unbearable pain (escape acceptance) or a transition to a peaceful afterlife (approach acceptance). Furthermore, traditional Chinese values of filial piety (Xiao) and benevolence (Ren) deeply shape these responses. [18] These cultural imperatives obligate nurses to view a peaceful death as the

ultimate relief for suffering patients, even while personally fearing the loss, thereby intensifying their cognitive dissonance.

This intense emotional engagement contrasts sharply with Profile 2 ("Detached Coping"), which exhibited uniformly low scores across all dimensions. Although low death fear might superficially resemble effective coping, the concurrent absence of any acceptance dimensions signifies severe emotional blunting and depersonalization. Recent literature demonstrates that such generalized emotional withdrawal functions as a maladaptive defense mechanism, strongly predicting compassion fatigue, burnout, and professional turnover [30, 31]. Therefore, while Profile 1 reflects a highly empathetic state struggling for existential meaning, Profile 2 indicates a dangerous psychological withdrawal from patient care that demands urgent managerial intervention.

Diverging from these emotional extremes, Profile 3 ("Normative-Balanced") establishes the normative baseline of the sampled workforce. With standardized scores hovering consistently near the mean across all dimensions, this profile reflects pragmatic adaptation. These nurses have developed sufficient routine coping mechanisms to function effectively in clinical environments without succumbing to intense anxiety or defensive detachment. Recent latent profile analyses of death anxiety among clinical nurses frequently identify this "moderate" majority, which comprises individuals who rely on standard, everyday coping strategies rather than engaging in deep existential reflection [32].

However, this pragmatic state exhibits inherent vulnerability. Lacking the profound cognitive reframing characteristic of Profile 1, these nurses often struggle to process sudden, highly traumatic end-of-life events. If systematic death education fails to expand their coping repertoire, cumulative grief and clinical trauma can rapidly exhaust their routine defenses. Consequently, these nurses risk deteriorating into the emotionally blunted state of Profile 2 [33].

4.1.2 The Paradoxical Role of Systematic Death Education

Our multinomial logistic regression analysis reveals a striking reality: only 20.36% of the 5,505 nurses reported receiving systematic death education. Yet, this exposure served as a powerful predictor of profile membership. Crucially, compared to the pragmatic Profile 3, high exposure to systematic death education significantly increased the odds of belonging to the detached Profile 2 (OR = 2.54, 95% CI: 2.09–3.08, $p < 0.001$) and strongly predicted membership in the highly conflicted Profile 1 (OR = 1.42, 95% CI: 1.20–1.67, $p < 0.001$).

This paradoxical finding challenges the conventional expectation, which often assumes that death education uniformly mitigates death anxiety [34–36]. In many Western healthcare systems, palliative care curricula inherently integrate psychological debriefing, self-reflection, and grief support for the providers. Conversely, in the current Chinese context, systematic death education often functions as a 'cognitive catalyst' rather than an emotional buffer. [37] It typically emphasizes the technical and procedural aspects of dying—such as symptom management, corpse care, and breaking bad news to families—while severely neglecting the nurses' own psychological needs and grief processing. It strips

away defensive ignorance and forces nurses to confront their existential vulnerabilities yet leaves them without the psychological tools to process this trauma. Consequently, this 'naked' cognitive awakening inadvertently contributes to either intense cognitive dissonance (Profile 1: Ambivalent-Intense) or severe defensive emotional blunting (Profile 2: Detached Coping). [38]

The fact that 35.33% of nurses received only "scattered" content highlights a systemic flaw. Exposing nurses to high-mortality environments without systematic, structured debriefing forces them to rely on ad-hoc coping mechanisms, frequently leading to the emotional detachment seen in Profile 2. Systematic death education is the bridge that allows nurses to safely navigate the turbulent emotional waters of Profile 1 without drowning in burnout.

4.1.3 Socio-Demographic Vulnerabilities and Systemic Imperatives

The hierarchical regression models delineate the socio-demographic vulnerabilities shaping these attitudes. Notably, marital status emerged as a primary predictor; unmarried, divorced, or widowed nurses reported significantly higher death fear and avoidance than their married counterparts. Furthermore, educational attainment (e.g., Secondary Technical School versus Bachelor's Degree) directly impacted natural acceptance.

According to the Stress and Coping Theory, [39] strong social support systems function as essential buffers against occupational trauma. End-of-life care exacts a massive emotional toll. Marriage frequently provides a primary, stable emotional outlet to process this grief. When nurses lack this personal buffer—particularly unmarried or divorced individuals—the existential trauma of the clinical environment permeates their psychological defenses, directly exacerbating death fear and avoidance. [40, 41]

Consequently, these findings compel a paradigm shift: healthcare systems must transition from expecting individual resilience to engineering systemic organizational support. Young, unmarried nurses deployed to high-acuity wards constitute a highly vulnerable subpopulation. Nursing administrators can no longer depend on external personal networks to absorb clinical trauma. Instead, hospitals must institutionalize structural support mechanisms. Implementing Schwartz Center Rounds, [42] establishing Balint groups, [43] and enforcing mandatory psychological debriefs following traumatic patient deaths [44] will proactively construct the emotional buffering effect that these vulnerable nurses currently lack.

4.2 Clinical and Policy Implications

The findings of this nationwide study yield critical implications for nursing management, continuing education policies, and institutional support structures.

First, identifying three distinct latent profiles necessitates a paradigm shift from universal burnout interventions to precision-targeted psychological support. Clinical managers must recognize that nurses exhibiting low death fear (Profile 1) may not possess genuine resilience; rather, they often suffer from

profound emotional blunting and face a severe risk of compassion fatigue. Consequently, healthcare institutions should implement routine, non-punitive psychological screenings to detect nurses slipping into this detached state, thereby facilitating early intervention before irreversible burnout or turnover occurs.

Second, at the policy level, the paradoxical effect of systematic death education demands an immediate overhaul of continuing education curricula. Healthcare systems must abandon "naked" death education—training that exposes nurses to the harsh existential realities of mortality without providing a psychological safety net. Nursing policymakers must mandate that end-of-life training strictly integrated structured psychological debriefing. Education must transcend the mere transmission of palliative knowledge; it must actively equip nurses with strategies to process the moral distress and intense cognitive dissonance inherent in Profile 2.

Finally, the heightened vulnerability of unmarried and divorced nurses exposes a critical gap in occupational health management. Hospital administrators can no longer rely on a nurse's personal social network to absorb the cumulative grief of clinical practice. Instead, institutions must proactively engineer an organizational buffering effect. Implementing regular, multidisciplinary forums—such as Schwartz Center Rounds or Balint groups—during paid working hours proves essential. These platforms secure a safe space for nurses to collectively process the emotional labor of end-of-life care, effectively transforming isolated existential trauma into shared professional resilience.

4.3 Strengths and Limitations

Despite leveraging a robust, nationwide sample (n = 5448), this study presents several limitations. First, the cross-sectional design precludes causal inferences regarding the paradoxical impact of death education. We cannot definitively determine whether systematic education directly precipitates the emotional detachment observed in Profile 2, or whether already detached nurses selectively recall their educational exposure. Future longitudinal cohort studies must track how these latent profiles dynamically evolve following specific end-of-life educational interventions.

Second, relying on self-reported measures for such a culturally sensitive topic introduces social desirability bias. Because professional norms often pressure nurses to project stoicism and composure, participants may have underreported their death fear or artificially inflated their acceptance scores.

Third, the convenience sampling method via an administrative cascade distribution precludes the calculation of an exact response rate, which inevitably introduces potential selection bias. Given the deeply rooted cultural taboos surrounding death in China, nurses who experience extreme death anxiety or severe moral distress might have actively avoided participating in this survey. Consequently, our sample might overrepresent nurses who are relatively more comfortable discussing mortality. This suggests that the true prevalence of the highly conflicted 'Ambivalent-Intense' profile or the severely withdrawn 'Detached Coping' profile could be even higher in the general nursing population than our current observations indicate.

Finally, although LPA robustly quantifies these attitude typologies, quantitative modeling inherently obscures the phenomenological depth of nurses lived experiences. Future research of our team will employ mixed methods designs, integrating qualitative interviews to elucidate the nuanced psychological mechanisms and moral distress driving the intense cognitive dissonance observed in Profile 1.

5. Conclusion

The NDES2026 study provides robust, nationwide evidence that clinical nurses' death attitudes manifest as distinct, heterogeneous typologies rather than a monolithic continuum. Crucially, our latent profile analysis exposes the paradoxical impact of systematic death education. When institutions expose nurses to the existential realities of mortality without providing a concurrent psychological safety net, this educational exposure may inadvertently contribute to severe emotional blunting and intense cognitive dissonance. To optimize end-of-life care and safeguard the nursing workforce, healthcare systems must dismantle "one-size-fits-all" training paradigms. Policymakers must mandate the strict integration of institutionalized psychological support mechanisms into all death education curricula. By proactively targeting socio-demographically vulnerable nurses, administrators can intercept the silent epidemic of emotional detachment and cultivate genuine, sustainable professional resilience.

Declarations

Human Ethics and Consent to Participate

This study was conducted in accordance with the Declaration of Helsinki. Ethical approval was obtained from the Ethics Committee of the School of Nursing, Lanzhou University, China (approval No. LZUHLXY20250198). All participants were informed about the purpose, procedures, risks, and benefits of the study prior to their participation. Written informed consent was obtained from all individual participants included in the study. Participants were assured of their right to withdraw from the study at any time without any consequences.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Availability of data and material

The datasets generated and/or analyzed during the current study are not publicly available due to the privacy protection of participating nurses and restrictions imposed to prevent potential identification of individual participants. However, data is available from the corresponding author upon reasonable request, subject to ethical approval for the proposed secondary analysis.

Funding

None to declare.

Consent to participate

Informed consent was obtained from all individual participants included in this study. All participating nurses were informed about the purpose of the study, the voluntary nature of their participation, confidentiality of their responses, and their right to withdraw at any time without consequences. Completion and return of the questionnaire were considered as implied consent. The consent procedure was approved by the Ethics Committee of the School of Nursing, Lanzhou University, China (approval No. LZUHLXY20250198).

Consent for publication

Not applicable. This manuscript does not contain any individual person's data in any form (including individual details, images, or videos). Only aggregated, anonymized data are reported.

Authors' contributions

F.D. and Y.W. conceptualized and designed the study. F.D. performed the formal analysis (latent profile analysis) and wrote the original draft. Y.M. and L.H. contributed to data curation and investigation. Y.W. and Y.M. reviewed and edited the manuscript. L.H. supervised the project. All authors reviewed and approved the final manuscript.

Declaration of generative AI use

Authors declare the generative AI in the manuscript preparation process was used.

During the preparation of this manuscript, the author(s) used generative AI [Gemini] to improve readability, polish the English language, and check spelling. The authors confirm that all study design, data analysis, interpretation of results, and generation of figures and tables were conducted entirely and independently by the human authors without the use of AI.

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Table

Table 3 is available in the Supplementary Files section.

Figures

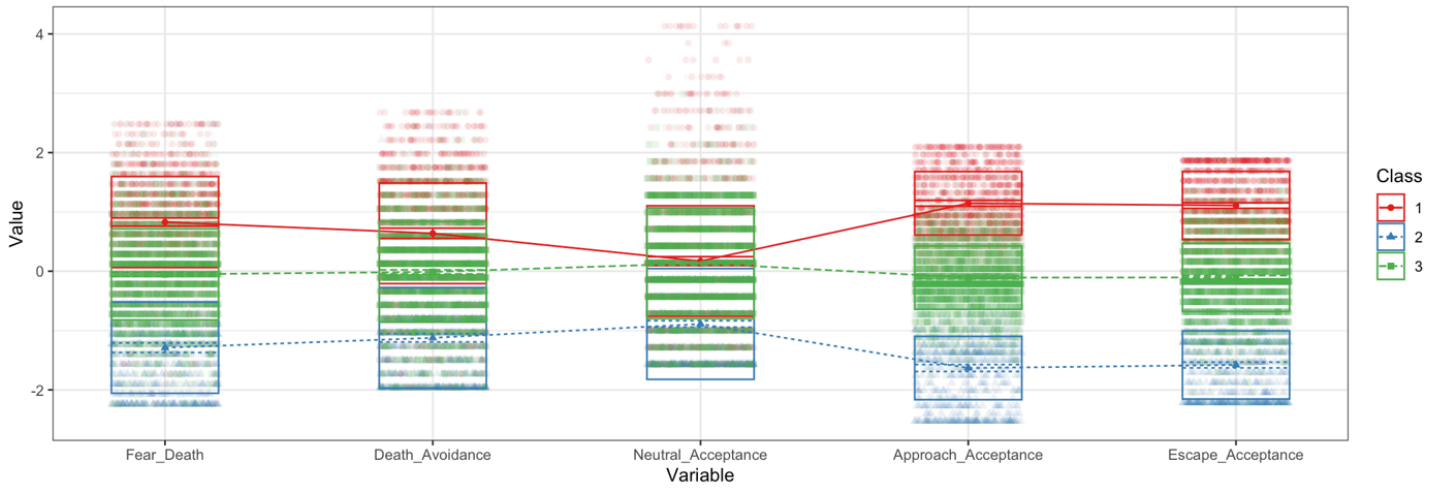


Figure 1

Latent profiles of death attitude among nurses

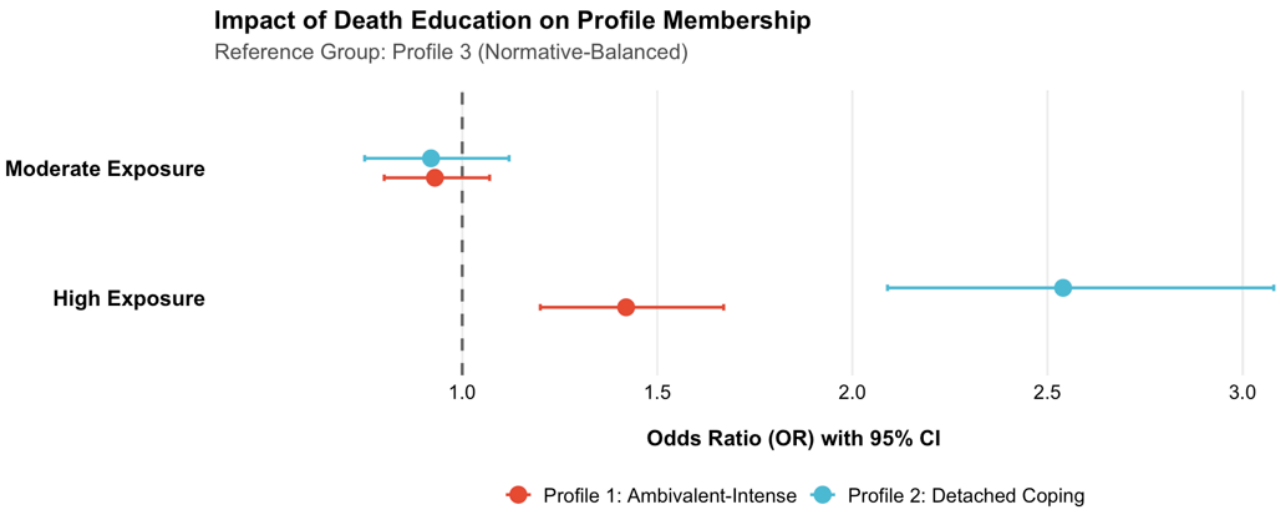


Figure 2

Impact of death education on profile membership

Supplementary Files

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