

A Study on the Level of Good Death and Its Influencing Factors for Emergency Department Deceased Patients from the Perspective of Family Members

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Abstract

Objective: To investigate the level of good death among emergency department deceased patients and analyze its influencing factors, so as to provide a scientific basis for optimizing end-of-life care practices in the emergency setting. **Methods:** Using convenience sampling, 203 family members of patients who died in the emergency department of a tertiary hospital in Guangzhou were selected as study subjects. Data were collected using a general information questionnaire, the Chinese version of the Good Death Inventory (GDI), and the Chinese version of the Care Evaluation Scale (CES). Univariate analysis and linear regression were employed to analyze the factors influencing the level of good death. Results: The average GDI score for emergency department deceased patients was 224.46 ± 47.75 , with 39 of 203 patients (19.2%) meeting the predefined basic criterion for a good death (mean GDI item score ≥ 5). Linear regression results indicated that the patient's age at death, educational level (college or above), awareness of impending death, physical care provided by physicians, environmental comfort, accessibility of medical resources, and the length of the final hospitalization/observation stay were influencing factors for the level of good death ($P < 0.05$). A sensitivity model additionally adjusting for time from death to survey showed that the recall interval was not significantly associated with GDI score and did not materially change the main findings. **Conclusion:** The level of good death among emergency department deceased patients urgently needs improvement. Particular attention and enhancement should be directed towards the dimensions of care that significantly impact the good death level.

Keywords

Family Members, Emergency Department, Good Death, End-of-Life Care, Hospice Care

1. Introduction

The emergency department serves as the primary site for the initial treatment of critically ill patients [1]. Influenced by factors such as an aging population, increased incidence of malignant tumors and chronic diseases, and strained hospital bed capacity, the number of terminal patients in the emergency department has risen significantly [2]. The “Healthy China 2030” Planning Outline emphasizes that the focus on health from 2016 to 2030 must “cover the entire life cycle” [3]. Furthermore, the “Basic Medical and Health Care and Health Promotion Law of the People’s Republic of China” explicitly mandates that medical institutions provide citizens with comprehensive services encompassing prevention, treatment, rehabilitation, and hospice care throughout the entire life cycle [4]. Against this backdrop, providing hospice care and achieving a good death have become significant public health issues. A good death refers to one that meets clinical, cultural, and ethical requirements, fully respects the wishes of both patients and their families, and spares them from unnecessary suffering and grief [5]. The ED environment is characterized by time pressure, diagnostic uncertainty, and a primary focus on life-saving interventions, which can often overshadow the needs of dying patients and their grieving families.

From the family’s perspective, a sudden death in the ED can be a profoundly traumatic experience. Their perception of the death’s quality becomes a lasting memory and a critical component of their bereavement process. Previous research has identified core components of a good death, including adequate symptom management, clear decision-making, being treated with dignity, and having family present.

Existing domestic research primarily focuses on cancer patients, ICU patients, and the elderly in nursing homes, with a notable lack of attention paid to the quality of death among emergency department patients [6]. Currently, the level of a good death is primarily evaluated retrospectively from the perspectives of healthcare professionals [7], the patients themselves [8], and family members [9]. Research indicates that assessing the deceased patient’s death quality through the perspective of family members is a feasible and effective method [9] [10].

However, there is a paucity of research specifically quantifying the level of a good death and its determinants within the unique context of the ED from the perspectives of family members. Understanding which factors most significantly impact family perceptions is essential for guiding quality improvement initiatives.

Therefore, this study employs a quantitative approach to: 1) Assess the level of a good death as perceived by the family members of patients who died in the ED, and 2) Identify the key factors that influence this perception, aiming to inform improvements in clinical practice.

2. Methods

2.1. Study Design and Participants

Using a convenience sampling method, family members of 203 patients who died in the emergency department of a tertiary hospital in Guangzhou between September 1, 2020, and August 31, 2024, were selected as study subjects. Inclusion criteria: 1) Patients: age ≥ 18 years; emergency hospitalization/observation time ≥ 24 hours; time since death at the time of survey ranged from 1 month to 3 years. The ≥ 24 -hour criterion was used to ensure that family members had sufficient exposure to the patient's end-of-life care process and could evaluate the emergency care experience. However, this criterion may exclude the most abrupt ED deaths and therefore narrow the generalizability of the findings. 2) Family members: age ≥ 18 years; education level of primary school or above; informed consent and voluntary participation; primary involvement in the patient's end-of-life care and medical decision-making. Exclusion criteria: 1) Patients: no family members accompanying them. 2) Family members: incorrect/out-of-service phone number; inability to complete the questionnaire. Based on the multiple linear regression sample size calculation method described in Fang Jiquan's Statistical Methods for Biomedical Research (Second Edition) [11], the sample size needed to be 5 - 10 times the number of variables. Relevant studies identified 35 variables influencing a good death [12], resulting in a calculated sample size of 175 - 350. Accounting for a 10% rate of invalid responses, 203 cases were ultimately included. This study received formal approval from the hospital's ethics committee (Ethics Approval No. Lun Shen Lin [2023] 497).

2.2. Data Collection

2.2.1. General Information Questionnaire

Developed by the researchers based on literature review and panel discussions, this questionnaire collected data related to deceased emergency department patients and their family members.

- **Patient Data:** Gender, age, education level, marital status, religious belief, payment method for healthcare, relationship with family/friends/colleagues, awareness of diagnosis and impending death, communication of cardiopulmonary resuscitation (CPR) preferences, cause of death, length of hospital stay (observation).
- **Family Member Data:** Gender, age, education level, occupation, marital status, religious belief, average monthly household income per capita, relationship to the patient, health status during the caregiving period.

2.2.2. Chinese Version of the Good Death Inventory (GDI)

This scale, translated and cross-culturally adapted by Zhao Juanjuan *et al.* [10], was used to measure the level of good death among emergency department patients. It encompasses 18 dimensions (10 core and 8 secondary dimensions), with 3 items per dimension, totaling 54 items. Responses are recorded on a Likert 7-point scale (from 1 = “strongly disagree” to 7 = “strongly agree”). The total GDI score is the sum of all 54 items, and the item mean is the total score divided by 54. In this study, meeting the basic criterion for a good death was defined a priori as a mean GDI item score ≥ 5 , consistent with the scale interpretation used in prior Chinese GDI research.

2.2.3. Chinese Version of the Care Evaluation Scale (CES)

Also translated and cross-culturally adapted by Zhao Juanjuan *et al.* [13], this scale was used to evaluate the quality of end-of-life care received by patients. It contains 28 items across three structural dimensions of care (environmental comfort, reasonableness of costs, and accessibility of medical resources) and seven process dimensions of care (physical care provided by doctors/nurses, psycho-existential care, explanations provided by doctors to patients/family members, attention to family health, and coordination and consistency of medical care). Items are rated on a Likert 6-point scale (1 = “strongly disagree,” 6 = “strongly agree”), with an additional “not applicable” option. Following the validated Chinese CES scoring procedure, “not applicable” responses were treated as missing and replaced with the corresponding item mean of valid responses before the domain and total scores were calculated. CES domain scores were analyzed as item-sum scores in regression models and converted to a 0 - 100 scale for descriptive reporting.

2.3. Data Collection and Quality Control

Prior to formal data collection, all four investigators received standardized training. Investigators contacted eligible family members by phone. Upon obtaining consent, the questionnaire link was sent via SMS, WeChat, or email. Collected questionnaires were jointly organized, checked, and analyzed by two researchers. From the hospital's statistics department, information for 741 family members meeting the inclusion criteria was obtained. Among these, 86 (11.6%) were unreachable and 132 (17.8%) refused to participate. Consequently, 523 family members agreed to participate and received questionnaires. A total of 205 questionnaires were returned. After excluding 2 invalid responses, 203 valid questionnaires remained. The effective response rate was calculated as $203/523$ (38.8%), using the number of questionnaires distributed to consenting family members as the denominator; the valid response proportion among all initially eligible family members was $203/741$ (27.4%).

2.4. Statistical Analysis

Data were analyzed using SPSS software (version 27.0). Quantitative data are described using mean $\pm$ standard deviation; categorical data are described using fre-

quencies and percentages. Independent samples t-tests or analysis of variance (ANOVA) were used to examine differences in GDI scores based on patient and family member socio-demographic characteristics. Pearson correlation analysis was employed to assess the relationship between the level of good death (GDI score) and the quality of end-of-life care (CES score) among deceased emergency department patients. Stepwise linear regression was performed to identify factors influencing the level of good death. To evaluate potential recall bias caused by the wide interval between death and survey completion, a sensitivity model was fitted by additionally entering time from death to survey (months) into the final regression model. A P-value of <0.05 was considered statistically significant.

3. Results

3.1. General Characteristics of Deceased Emergency Department Patients and Their Family Members

The interval between the survey and patient death was 14.1 ± 9.7 months. The mean age of deceased patients was 73.93 ± 16.05 years, 53.7% were male, 5.4% had a religious affiliation, and 80.3% had a high school education or below; 59.6% lived with family prior to death, with most reporting good relationships with family (82.8%) and friends/colleagues (71.9%); 62.6% were aware of their disease diagnosis, 47.8% were aware of impending death before passing away; 50.2% had made end-of-life arrangements; only 28.6% had expressed preferences regarding cardiopulmonary resuscitation (6 accepted, 52 refused). Regarding disease distribution, respiratory system diseases were most common (34.5%), followed by digestive system diseases (16.7%) and circulatory system diseases (16.3%). See **Table 1**.

The mean age of the deceased patients' family members was 48.45 ± 11.53 years; 54.2% were male, 8.9% had a religious affiliation, 67.0% had a college degree or above, 66.5% were the patients' children, and 59.6% lived with the patient. During the patient's final hospitalization/observation period, family members spent a median of 8 (IQR: 5, 12) hours per day with the patient and provided care for a median of 3 (IQR: 1, 5) days per week. Pre-hospital visit frequency was collected only among family members who did not live with the patient before the final hospitalization ($n = 82$). See **Table 2**.

3.2. Status of Good Death Level among Emergency Department Decedents

The mean total score of the Good Death Inventory (GDI) in this study was 224.46 ± 47.75 , and the mean item score was 4.16 ± 0.88 . According to the predefined criterion of mean GDI item score ≥ 5 , 39 of 203 patients met the basic criterion for a good death, yielding a proportion of 19.2% (39/203). The dimensions were ranked in descending order based on their mean item scores (scale 1 - 7). The top four dimensions were Dimension 11 "Receiving sufficient treatment", Dimension 6 "Good relationship with family", Dimension 13 "Preparation for death", and Dimension 17 "Feeling life is worthwhile". The lowest

five dimensions were Dimension 7 “Independence”, Dimension 18 “Religious and spiritual comfort”, Dimension 14 “Control over the future”, Dimension 1 “Physical and psychological comfort”, and Dimension 2 “Dying in preferred location”. See **Table 3**.

3.3. Status of End-of-Life Care Quality for Emergency Department Decedents

Scores were converted to a percentage (0 - 100 scale) for ease of interpretation. The mean item score for the total scale was 54.82 ± 12.89 . The dimensions were ranked in descending order based on their mean scores. The top three were “Explanation provided by physicians to family members”, “Psycho-existential care”, and “Reasonableness of expenses”. The bottom three were “Explanation provided by physicians to patients”, “Accessibility of medical resources”, and “Environmental comfort”. See **Table 4**.

The frequency of CES mean substitution for “not applicable” responses was low. By domain, substitutions were 0/609 cells (0.0%) for physical care by doctors, 0/609 (0.0%) for physical care by nurses, 8/609 (1.31%) for psycho-existential care, 21/609 (3.45%) for doctors’ explanations to patients, 0/609 (0.0%) for doctors’ explanations to family members, 0/609 (0.0%) for environmental comfort, 2/406 (0.49%) for reasonableness of cost, 0/406 (0.0%) for attention to family health, 21/609 (3.45%) for accessibility of medical resources, and 0/609 (0.0%) for coordination and consistency of medical care.

3.4. Univariate Analysis of Good Death Levels in Emergency Department Decedents

This study revealed that patients who were over 60 years of age, not employed, aware of impending death, had expressed resuscitation preferences and made end-of-life arrangements, and had harmonious relationships with relatives and friends exhibited significantly higher Good Death scores. Furthermore, female family caregivers, those who visited the patient daily or more frequently among non-cohabiting family members, and those who provided an average of 0 - 8 hours of care per day during the patient’s final hospitalization/observation period rated the patient’s Good Death level significantly higher ($P < 0.05$). See **Table 5**.

3.5. Correlation between Good Death Level and End-of-Life Care Quality for Emergency Department Decedents

Pearson correlation analysis was employed to examine the relationships between the total Good Death score and the total care quality score, as well as its subdomain scores, among emergency department decedents. The results indicated a significant positive correlation between the total GDI score and the total CES score ($r = 0.627$, $P < 0.01$). Furthermore, the total GDI score was significantly positively correlated with the total CES score and all its subdomain scores. See **Table 6**.

3.6. Analysis of Factors Influencing the Good Death Level of Emergency Department Decedents

Using the total GDI score of emergency department decedents as the dependent variable, and the subdomains of the CES as independent variables, a stepwise regression analysis was conducted. This analysis controlled for covariates including general demographic characteristics of both patients and their family caregivers, as well as patient disease characteristics. Specific variable assignments are detailed in **Table 7**. The results identified the following as significant influencing factors for the Good Death level among emergency department decedents ($P < 0.05$): the patient's age at death ($B = 0.733$), awareness of impending death ($B = 15.840$), having an educational level of college/university or above ($B = 12.697$), physical care provided by physicians ($B = 5.476$), environmental comfort ($B = 3.797$), accessibility of medical resources ($B = 4.652$), and the duration of the final hospitalization/observation period ($B = -0.335$). Collectively, these factors accounted for 60.7% of the variance in the Good Death level among emergency department decedents. See **Table 8**.

In the sensitivity model additionally adjusted for time from death to survey, the recall interval was not significantly associated with GDI total score ($B = 0.010$, 95% CI: -0.432 to 0.452 , $P = 0.965$). The direction, magnitude, and statistical significance of the main predictors were materially unchanged, suggesting that the primary findings were robust to the recall-window adjustment.

Table 1. General information and disease characteristics of patients ($n = 203$).

Item	Frequency (<i>n</i>)	Percentage (%)
Gender		
Male	109	53.7
Female	94	46.3
Age (Years)		
18 - 44	15	7.4
45 - 59	12	5.9
60 - 79	79	38.9
≥80	97	47.8
Education Level		
Primary school	69	34.0
Junior high school	43	21.2
High school/Technical secondary	51	25.1
College or above	40	19.7
Marital Status		
Married	135	66.5
Not married	68	33.5

Continued

Religious Belief		
Yes	11	5.4
No	192	94.6
Disease Diagnosis		
Respiratory system	70	34.5
Digestive system	34	16.7
Circulatory system	33	16.3
Sepsis	23	11.3
Cerebrovascular accident	14	6.9
Multiple organ failure	8	3.9
Others	21	10.3
Time from Death to Survey (Months)		
<12	97	47.8
12.1 - 24	62	30.5
≥24	44	21.7
Last Hospitalization/Observation Duration (Days)		
1 - 3	60	29.6
4 - 7	43	21.2
8 - 15	52	25.6
16 - 30	35	17.2
≥31	13	6.4
Awareness of Diagnosis		
Yes	127	62.6
No	76	37.4
Awareness of Death Approaching		
Yes	97	47.8
No	106	52.2
CPR Preference Expressed		
Yes	58	28.6
No	145	71.4
Funeral Arrangements Expressed		
Yes	102	50.2
No	101	49.8
Relationship with Family		
Good	168	82.8
Fair	35	17.3
Relationship with Friends/Colleagues		
Good	146	71.9
Fair	57	28.1

Table 2. General information of family members ($n = 203$).

Item	Frequency (n)	Percentage (%)
Gender		
Male	110	54.2
Female	93	45.8
Age (Years)		
18 - 44	71	35.0
45 - 59	93	45.8
≥ 60	39	19.2
Education Level		
Primary school	7	3.4
Junior high school	25	12.3
High school/Technical secondary	35	17.2
College	45	22.2
Bachelor	66	32.5
Master or above	25	12.3
Religious Belief		
Yes	18	8.9
No	185	91.1
Employment Status		
Employed	163	80.3
Not employed	40	19.7
Marital Status		
Married	151	74.4
Not married	52	25.6
Health Status		
Good	135	66.5
Fair	68	33.5
Relationship with Patient		
Spouse	25	12.3
Children	135	66.5
Others	43	21.2
Living with Patient		
Yes	121	59.6
No	82	40.4

Continued

Visit Frequency before Hospitalization (among family members not living with the patient, $n = 82$)		
≥Once daily	8	9.8
≥Once weekly	40	48.8
≥Once monthly	11	13.4
≤Once monthly	23	28
Care Days per Week During Hospitalization		
0 - 2	83	40.9
3 - 4	66	32.5
5 - 6	24	11.8
7	30	14.8
Care Hours per Week During Hospitalization		
0 - 8	124	61.1
9 - 16	39	19.2
17 - 24	40	19.7
Other Caregivers		
Yes	184	90.6
No	19	9.4

Table 3. GDI questionnaire total score and dimension scores ($n = 203$).

Dimension	Mean Score ($\bar{X} \pm s$)
GDI Total Score	4.16 ± 0.88
GDI Core Dimension Total Score	4.10 ± 1.08
GDI Secondary Dimension Total Score	4.22 ± 0.77
Dimension 11. Receiving Adequate Treatment	5.22 ± 1.13
Dimension 6. Good Relationship with Family	5.18 ± 1.20
Dimension 13. Preparation for Death	5.03 ± 1.25
Dimension 17. Feeling Life is Worthwhile	4.93 ± 1.24
Dimension 16. Pride and Dignity	4.76 ± 1.17
Dimension 3. Maintaining Hope and Cheerfulness	4.74 ± 1.17
Dimension 4. Good Relationship with Medical Staff	4.58 ± 1.14
Dimension 9. Being Respected as a Person	4.56 ± 1.33
Dimension 5. Not Being a Burden to Others	4.53 ± 1.54
Dimension 10. Integrity of Life	4.21 ± 1.70
Dimension 12. Natural Death	4.20 ± 1.11
Dimension 8. Environmental Comfort	3.78 ± 1.55
Dimension 15. Not Being Aware of Death	3.78 ± 1.62

Continued

Dimension 2. Dying in Preferred Location	3.68 ± 1.95
Dimension 1. Physical and Psychological Comfort	3.46 ± 1.88
Dimension 14. Control over the Future	3.43 ± 1.68
Dimension 18. Religious and Spiritual Comfort	2.44 ± 1.62
Dimension 7. Independence	2.30 ± 1.12

Table 4. CES questionnaire total score and dimension scores ($n = 203$).

Dimension	Mean Score ($\bar{X} \pm s$)	Total Score ($\bar{X} \pm s$)
CES Total Score	3.73 ± 0.63	54.82 ± 12.89
CES Dimension 5. Doctor's Explanation to Family	4.30 ± 0.91	66.08 ± 18.19
CES Dimension 3. Psycho-existential Care	4.13 ± 0.98	62.66 ± 19.67
CES Dimension 7. Reasonableness of Cost	4.10 ± 0.78	61.99 ± 15.58
CES Dimension 8. Attention to Family Health	4.07 ± 1.08	61.43 ± 21.54
CES Dimension 10. Coordination of Medical Care	3.93 ± 0.72	58.62 ± 14.35
CES Dimension 2. Physical Care by Nurses	3.85 ± 0.69	56.95 ± 13.79
CES Dimension 1. Physical Care by Doctors	3.78 ± 0.81	55.80 ± 16.23
CES Dimension 6. Environmental Comfort	3.49 ± 1.16	49.89 ± 23.30
CES Dimension 9. Accessibility of Medical Resources	3.27 ± 0.87	45.49 ± 17.52
CES Dimension 4. Doctor's Explanation to Patient	2.71 ± 1.09	34.24 ± 21.72

Table 5. Differences in GDI total score by general information of emergency death patients and family members ($n = 203$).

Item	GDI Total Score ($\bar{X} \pm s$)	F/t	P
Patient Characteristics			
Age (years)		12.865	<0.01
18 - 44 ①	162.53 ± 36.58		
45 - 59 ②	217.83 ± 46.39		② ①*
60 - 79 ③	221.44 ± 46.49		③ ②*
≥80 ④	237.32 ± 42.66		④ ③*
Employment Status		-2.774	0.006
Employed	182.00 ± 45.76		
Not employed	226.43 ± 47.03		
Awareness of Death Approaching		2.195	0.029
Yes	232.08 ± 48.66		
No	217.49 ± 46.03		
CPR Preference Expressed		2.968	0.003
Yes	239.90 ± 46.53		
No	218.29 ± 46.98		

Continued

Funeral Arrangements Expressed		3.309	0.001
Yes	235.24 ± 43.21		
No	213.58 ± 49.82		
Relationship with Family		3.591	<0.001
Good	230.22 ± 45.14		
Fair	198.58 ± 51.82		
Relationship with Friends/Colleagues		2.373	0.019
Good	229.38 ± 48.74		
Fair	211.88 ± 43.00		
Family Member Characteristics			
Gender		-2.018	0.045
Male	218.29 ± 49.35		
Female	231.76 ± 44.96		
Average Daily Care Hours		3.237	0.041
0 - 8 ①	231.19 ± 40.43		① ③*
9 - 16 ②	214.18 ± 55.08		② ③*
17 - 24 ③	213.63 ± 57.68		
Visit Frequency in Last Year		2.709	0.031
≥Once daily ①	240.50 ± 56.83		① ②*
≥Once weekly ②	238.35 ± 43.16		② ③*
≥Once monthly ③	238.82 ± 48.63		③ ④*
≤Once monthly ④	202.70 ± 61.57		

Table 6. Correlation between GDI total score, GDI dimensions and CES total score, CES dimensions ($n = 203$).

Dimension	CES 1 Physical Care by Doctors	CES 2 Physical Care by Nurses	CES 3 Psycho- existential Care	CES 4 Doctor's Explanation to Patient	CES 5 Doctor's Explanation to Family	CES 6 Environmental Comfort	CES 7 Reasonable- ness of Cost to Family	CES 8 Attention to Family Health	CES 9 Accessibility of Medical Resources	CES 10 Coordination of Medical Care	CES Total
GDI Total	0.588**	0.506**	0.480**	0.165*	0.405**	0.587**	0.343**	0.457**	0.564**	0.343**	0.627**
GDI 1 Physical and Psychological Comfort	0.412**	0.350**	0.392**	0.159*	0.300**	0.446**	0.306**	0.333**	0.393**	0.278**	0.477**
GDI 2 Dying in Preferred Location	0.433**	0.365**	0.392**	0.133	0.329**	0.467**	0.328**	0.397**	0.438**	0.260**	0.499**
GDI 3 Maintaining Hope and Cheerfulness	0.428**	0.442**	0.423**	0.079	0.383**	0.404**	0.274**	0.387**	0.347**	0.227**	0.475**
GDI 4 Good Relationship with Medical Staff	0.578**	0.531**	0.459**	0.114	0.434**	0.484**	0.263**	0.431**	0.506**	0.346**	0.583**
GDI 5 Not Being a Burden to Others	0.449**	0.403**	0.303**	0.164*	0.307**	0.395**	0.229**	0.331**	0.387**	0.229**	0.451**
GDI 6 Good Relationship with Family	0.423**	0.381**	0.328**	0.11	0.263**	0.402**	0.246**	0.340**	0.370**	0.236**	0.435**

Continued

GDI 7 Independence	0.158*	0.042	0.11	0.1	0.043	0.239**	0.068	0.083	0.129	0.092	0.160*
GDI 8 Environmental Comfort	0.523**	0.432**	0.483**	0.062	0.374**	0.721**	0.424**	0.497**	0.605**	0.334**	0.630**
GDI 9 Being Respected as a Person	0.527**	0.419**	0.373**	0.128	0.378**	0.566**	0.331**	0.458**	0.571**	0.338**	0.576**
GDI 10 Integrity of Life	0.425**	0.381**	0.370**	0.186**	0.302**	0.457**	0.217**	0.346**	0.417**	0.264**	0.481**
GDI 11 Receiving Adequate Treatment	0.452**	0.364**	0.344**	0.264**	0.293**	0.392**	0.230**	0.350**	0.390**	0.275**	0.478**
GDI 12 Natural Death	0.395**	0.303**	0.353**	0.104	0.360**	0.456**	0.341**	0.433**	0.386**	0.368**	0.488**
GDI 13 Preparation for Death	0.433**	0.368**	0.305**	0.127	0.242**	0.394**	0.234**	0.311**	0.419**	0.172*	0.425**
GDI 14 Control over the Future	0.235**	0.183**	0.073	0.325**	0.034	0.169*	0.131	0.103	0.188**	0.027	0.215**
GDI 15 Not Being Aware of Death	0.02	0.04	0.05	-0.273**	0.016	-0.013	-0.105	-0.046	0.068	0.062	-0.031
GDI 16 Pride and Dignity	0.434**	0.418**	0.375**	0.089	0.344**	0.359**	0.241**	0.290**	0.361**	0.283**	0.447**
GDI 17 Feeling Life is Worthwhile	0.344**	0.362**	0.364**	0.126	0.256**	0.345**	0.191**	0.293**	0.340**	0.208**	0.401**
GDI 18 Religious and Spiritual Comfort	0.078	0.035	0.009	-0.098	0.019	0.013	-0.04	-0.064	0.095	-0.034	0.003

Note: *P < 0.05; **P < 0.01.

Table 7. Multi-categorical variable assignment table.

Independent Variable	Assignment Description
Patient Characteristics	
Age	Continuous variable
Education Level	1 ≤ Primary, 0 = Junior high, 0 = High school/Tech, 0 ≥ College 0 ≤ Primary, 1 = Junior high, 0 = High school/Tech, 0 ≥ College 0 ≤ Primary, 0 = Junior high, 1 = High school/Tech, 0 ≥ College 0 ≤ Primary, 0 = Junior high, 0 = High school/Tech, 1 ≥ College
Relationship with Family	1 = Good, 0 = Fair
Relationship with Friends/Colleagues	1 = Good, 0 = Fair
Awareness of Death Approaching	1 = Yes, 0 = No
CPR Preference Expressed	1 = Yes, 0 = No
Funeral Arrangements Expressed	1 = Yes, 0 = No
Last Hospitalization Duration	Continuous variable
Family Member Characteristics	
Gender	1 = Male, 0 = Female
Average Daily Care Hours	Continuous variable
Visit Frequency in Last Year	1 = Daily ≥ 1, 0 = Weekly ≥ 1, 0 = Monthly ≥ 1, 0 = Monthly < 1 0 = Daily ≥ 1, 1 = Weekly ≥ 1, 0 = Monthly ≥ 1, 0 = Monthly < 1 0 = Daily ≥ 1, 0 = Weekly ≥ 1, 1 = Monthly ≥ 1, 0 = Monthly < 1 0 = Daily ≥ 1, 0 = Weekly ≥ 1, 0 = Monthly ≥ 1, 1 = Monthly < 1

Continued

Care Structure	
CES Dimension 6. Environmental Comfort	
CES Dimension 7. Reasonableness of Cost	Continuous variable
CES Dimension 9. Accessibility of Medical Resources	
Care Process	
CES Dimension 1. Physical Care by Doctors	
CES Dimension 2. Physical Care by Nurses	
CES Dimension 3. Psycho-existential Care	
CES Dimension 4. Doctor's Explanation to Patient	Continuous variable
CES Dimension 5. Doctor's Explanation to Family	
CES Dimension 8. Attention to Family Health	
CES Dimension 10. Coordination of Medical Care	

Table 8. Multiple linear regression analysis of factors influencing good death in emergency patients ($n = 203$).

Independent Variable	B	SE	b'	t	95% CI Lower	95% CI Upper	P	VIF
Constant	16.60	13.72	-	1.21	-10.46	43.67	0.228	-
Age at death	0.733	0.140	0.246	5.238	0.457	1.009	<0.001	1.099
Awareness of death	15.84	4.39	0.166	3.610	7.187	24.49	<0.001	1.052
College or above	12.70	5.36	0.107	2.371	2.135	23.26	0.019	1.012
Final stay duration	-0.335	0.151	-0.101	-2.216	-0.633	-0.037	0.028	1.035
CES1 doctors' physical care	5.476	1.091	0.279	5.019	3.324	7.628	<0.001	1.537
CES6 environmental comfort	3.797	0.816	0.278	4.653	2.188	5.407	<0.001	1.772
CES9 medical resource access	4.652	1.028	0.256	4.523	2.623	6.680	<0.001	1.592

4. Discussion

4.1. Level of Good Death among Emergency Department Decedents

4.1.1. The Overall Level of Good Death among Emergency Department Decedents Is Moderate

In this study, the total GDI score was 224.46 ± 47.75 , with an item mean score of 4.16 ± 0.88 . According to the predefined GDI criterion used in this study, a mean item score ≥ 5 indicates the basic achievement of a good death. Based on this rule, 39 of 203 emergency department decedents (19.2%) essentially attained a good death level. This finding is close to the results of a good death survey conducted by Yang *et al.* from nurses' perspective regarding cancer decedents (total good death score 245.40 ± 36.91 , proportion with item mean score ≥ 5 was 20.9%) [14]. Furthermore, the survey results of Zhao Juanjuan *et al.* on 305 family members of cancer patients showed a total good death score of 241.20 ± 39.45 , with the proportion of patients having an item mean score ≥ 5 being 24.3% [12]. These results indicate that the level of good death for both emergency department patients and cancer patients in China is moderate, and the quality of death for emergency pa-

tients urgently needs improvement to better meet clinical needs.

4.1.2. Main Characteristics of Good Death in Emergency Department Decedents

Descending order ranking revealed that the dimension “Receiving sufficient treatment” had the highest item mean score (5.22 ± 1.13), indicating that most emergency department decedents received relatively comprehensive medical interventions at the end of life. This result is higher than that found in Zhao Juanjuan *et al.*’s study on cancer patients (4.18 ± 1.25) [12]. This difference may stem from the characteristics of rapid response and high-intensity resuscitation in the emergency setting, which, compared to the relatively prolonged treatment process for cancer patients, more readily allows family members to intuitively perceive the full efforts of the medical team.

The item mean score for the dimension “Good relationship with family” ranked second (5.18 ± 1.20). Patients with good family relationships had significantly higher GDI scores (230.22 ± 45.14) than those with average relationships (198.58 ± 51.82) ($P < 0.001$), which aligns with the tradition of family coping with stress in Chinese culture. Hattori [15] noted that harmonious family relationships are an important prerequisite for achieving a good death.

Death preparation refers to the actions a person takes in preparation for the end of life, constituting a comprehensive process encompassing physical, psychological, social, and legal dimensions [16]. In this study, the dimension “Preparation for death” ranked third (5.03 ± 1.25), indirectly reflecting the relatively good fulfillment of the diverse needs of emergency department decedents and their families at the end of life. Adequate death preparation can alleviate death anxiety, assist in medical decision-making, reduce unnecessary interventions, and thereby enhance the quality of life at the end of life for patients [17]; it can also mitigate negative emotions among family members during bereavement [18]. It is important to note that some emergency patients died from sudden illnesses, lacking sufficient preparation for death, leading to lower scores in this dimension for this group, highlighting the urgency and particularity of death preparation in the emergency context.

In this study, the dimension “Independence” had the lowest score (2.30 ± 1.12), indicating that most emergency patients had difficulty maintaining basic physical mobility at the end of life. Reasons for this phenomenon include the impact of the disease itself and the use of various medical devices, such as cardiac monitoring, intravenous infusions, oxygen therapy, enteral nutrition tubes, various other lines, and physical restraints [19], all of which restrict patient mobility. Simultaneously, insufficient attention from emergency healthcare professionals to patients’ needs for maintaining physical activity is also a significant factor.

The item mean score for the dimension “Physical and psychological comfort” was 3.46 ± 1.88 , indicating that the physical and psychological suffering of decedents in the emergency department environment was not effectively controlled. As the emergency department primarily focuses on treatment and resuscitation,

coupled with insufficient nursing staff and a lack of related palliative or good death training [20] [21], comprehensive physical and psychological care is challenging to achieve.

The item mean score for the dimension “Environmental comfort” was 3.78 ± 1.55 . During telephone follow-ups, family members also mentioned issues such as “environment needs significant improvement,” “no bathing facilities, foul odor in toilets,” and “noisy like a marketplace at night.” As the frontline for acute and critical care, the environmental quality of the emergency department directly impacts patient outcomes and recovery processes. However, current emergency department environments in most hospitals have notable shortcomings: compact and complex spaces, lack of privacy and a quiet atmosphere, making it difficult for terminally ill patients and their families to attain peace and dignity [22] [23]. Noise interference from equipment, staff movement, and patient moans disrupts patient rest and exacerbates their anxiety and distress [24].

4.2. Factors Influencing Good Death in Emergency Department Decedents

General Characteristics of Patients and Their Family Members

The results of this study suggest that patient age is one of the important factors influencing the good death level of emergency patients. For each one-year increase in age, the good death score increased by 0.733 points ($P < 0.001$). Compared to young and middle-aged patients, elderly patients are generally more accepting of death and can face it with a calmer mindset, making preparations for death (arranging affairs, stating preferences regarding resuscitation) [12].

Patients who were “aware of impending death” had good death scores 15.840 points higher than those who were unaware ($P < 0.001$). This finding aligns with Western cultural concepts that consider “awareness of death” an important component of a good death, advocating for diverse end-of-life preparations among the public [25]. If patients are aware of impending death, they can more courageously discuss suitable options with doctors and family, actively seek palliative treatment, plan end-of-life matters, thereby enhancing comfort and sense of dignity in the final stage of life. However, a discrepancy exists between this finding and the conclusion of Zhao Juanjuan *et al.* [12]. This may be influenced, on one hand, by the Confucian cultural tradition of “not knowing life, how can you know death?” and on the other hand, closely related to the guiding role of Chinese medical ethics principles in clinical practice.

Patients with an educational level of college/university or above had higher good death scores (+12.697 points, $P = 0.019$). Populations with higher education levels tend to have better quality of death, attributed to their better ability to understand medical information and treatment options, and to adopt a proactive attitude towards illness, pursuing a higher quality of life [26].

The duration of the final hospitalization/observation period had a significant negative impact on the patient’s good death level. For each additional day of hos-

pitalization/observation, the good death score decreased by 0.335 points ($P = 0.028$). Longer hospitalization/observation periods are associated with increased risks of nosocomial infections, immunosuppression, and delirium, alongside rising medical costs and decreased family satisfaction with medical care, consequently affecting the patient's quality of death. Furthermore, a prolonged emergency stay may indicate more severe symptoms, greater treatment complexity, and longer exposure to the crowded emergency environment, thereby increasing psychological burden for patients and family members [27].

Physical care provided by doctors had a significant positive impact on good death ($B = 5.476$, $P < 0.001$). Studies have shown that stronger professional competence and nursing skills of healthcare providers, coupled with a better grasp of palliative care knowledge, enable them to play a more critical role in end-of-life care [27] [28]. Physicians prescribing appropriate medication to promptly alleviate physical discomfort and pain is crucial for the patient's good death. Certainly, nurses also play an indispensable role in the physical care of patients. However, in this study, only 60.1% of family members believed that "nurses possessed sufficient knowledge and skills to alleviate the patient's discomfort symptoms." This also indicates that when caring for terminally ill patients, nurses may pay insufficient attention to physical comfort, and their nursing philosophy and skills need enhancement.

CES dimension 6 "Environmental comfort" was significantly positively associated with good death ($B = 3.797$, $P < 0.001$). A good environment not only helps healthcare staff provide more meticulous physical and psychological care but also offers better support for family members. However, the noisy, confined space of the emergency department and frequent medical procedures easily cause psychological stress to patients [22]. During the COVID-19 pandemic, strict isolation policies impeded end-of-life care in the emergency department [29]. When the COVID-19 policy was fully lifted at the end of 2022, emergency departments undertook the task of treating a large number of COVID-19 patients, facing severe shortages of manpower, space, and medical supplies [30]. In this study, family members of the 28 patients who died during the COVID-19 period generally rated the emergency environment below 4 points. Clinically, medical staff use bed curtains and screens to provide a relatively independent space for emergency terminally ill patients, and some have reduced disruptions for patients and families spending their final moments together by turning off monitor alarms [31].

"Accessibility of medical resources" refers to the patient's ability to be admitted promptly and receive professional care when medical services are needed. Terminally ill patients often suffer from symptoms like physical pain that are difficult to control, leading families to ultimately choose the hospital emergency department for urgent management [32] [33]. In this study, CES dimension 9 "Accessibility of medical resources" significantly influenced good death ($B = 4.652$, $P < 0.001$). However, the item mean score for this dimension was 45.49 ± 17.52 , ranking second lowest among all dimensions. This situation is closely related to factors such

as severe overcrowding in tertiary general hospital emergency departments [34], difficulties in admission to specialized wards, and issues with health insurance policies [35]. In recent years, the state has introduced a series of policy measures to improve this situation. In 2017, the National Health Commission promulgated the “Palliative Care Practice Guidelines (Trial)” [36] and launched the first batch of pilot programs. With the initiation of the third batch of pilot work [37], the number of palliative care institutions and service teams has increased, allowing more patients to access professional care.

4.3. Implications and Recommendations for Emergency Clinical Practice

Many countries have focused on research regarding palliative care and quality of death for emergency department patients [38]. However, in China, the traditional view holds that the core function of the emergency department is emergency rescue, thus overlooking its value in palliative care. It is commendable that some scholars have begun active exploration: Ke Juqing *et al.* [39] introduced palliative care earlier into the emergency department to help patients and families choose suitable care plans, thereby improving the quality of life for terminal patients; Ning Xiaohong *et al.* [34] also achieved significant results by implementing palliative care consultations in the emergency department. The findings of this study demonstrate that the level of a good death is significantly influenced by factors within the control of healthcare systems and providers. To enhance the dying experience for patients and their families, we recommend: ① Optimize the care system by integrating palliative care into the emergency department, improving staffing, spatial layout, and related training; ② Strengthen physical and psychological care by enhancing symptom management and psychological support, and adding specialized nurses; ③ Promote Do Not Resuscitate (DNR) decisions and improve skills in delivering bad news; ④ Provide bereavement support for families and advance the popularization of palliative care and death education.

By focusing on these key areas, EDs can transform from being solely places of rescue to also being sanctuaries of compassion and dignity at the end of life.

5. Summary

This study is the first to systematically investigate the level of good death among emergency department decedents from the perspective of family members, filling a gap in this field of research. Simultaneously, using the Chinese versions of the GDI and CES scales, it quantitatively analyzed the association between good death and quality of care, and further examined the factors influencing the good death level of emergency department decedents, providing a reference for end-of-life care for emergency patients. Limitations of this study: 1) It was a single-center sample, potentially introducing some selection bias; 2) the inclusion criterion of emergency hospitalization/observation time ≥ 24 hours may have excluded the most abrupt emergency deaths, limiting generalizability to all ED deaths; 3) family

members' perceptions may change over time, and the 1-month to 3-year recall window may introduce recall bias, although the sensitivity analysis suggested that time from death to survey did not materially affect the main findings; 4) the questionnaire contained 120 items, and its length coupled with the sensitive topic of "death" somewhat reduced the effective response rate. Future research could employ multi-center stratified sampling to reduce selection bias, enhance generalizability through longitudinal tracking combined with qualitative studies, and streamline questionnaire items and optimize response methods to improve the effective response rate.

Data Availability Statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics Statement

Ethical approval was from the Clinical Research Ethics Committee of The First Affiliated Hospital of Sun-Yat Sen University (Ethics Approval No. Lun Shen Lin [2023] 497).

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Author Contributions

QH: Conceptualization, Methodology, Formal analysis, Investigation, Data Curation, Writing: Original Draft.

YH: Supervision, Project administration, Resources, Writing: Review & Editing.

All authors read and approved the final manuscript.

Conflicts of Interest

The authors declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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