

Physician Palliative Education Associated With High Use of Hospice Care Service

Mei-Hsing Chuang, MD, PhD^{1,2} , Fang-Niarn Lee, MD, MSC³,
Yih-Tsong Shiau, MD, MS⁴, Hsiu-Yi Shen, MS⁵, Chih-Ching Lee, MD^{4,6},
Saint Shiou-Sheng Chen, MD, PhD^{7,8,9,10}, and Sheng-Jean Huang, MD^{11,12}

American Journal of Hospice
& Palliative Medicine®
2022, Vol. 39(2) 237–242
© The Author(s) 2021



Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/10499091211014160
journals.sagepub.com/home/ajh



Abstract

Background: Taiwan's National Health Insurance provides coverage for palliative and hospice care. The following 10 types of diseases have been added to the National Health Insurance reimbursement regulation: end-stage cancer, motor neuron disease, organic psychosis, brain degeneration, heart failure, chronic airway obstruction diseases, other lung diseases, chronic liver disease and cirrhosis, acute renal failure, and chronic renal failure. **Objective:** This study aimed to determine the association between physicians' palliative education and use of hospice care in hospitalized patients at the end of life. **Design and Setting:** A cross-sectional study in a Taipei community hospital. **Participants:** Patients who died between 2014 and 2019 were identified. The deceased had at least 1 of the 10 diseases covered by health insurance were included. Hospice care services included hospice ward care and hospice shared care. This study included 2,661 individuals. In total, 972 (36.5%) patients used hospice care services. **Results:** After adjusting for age, gender, and comorbidities, physicians' palliative education was found to significantly associated with the use of hospice care (OR: 14.38, 95% CI: 10.90-18.98). **Conclusions:** Physicians' palliative education was found to be an independent factor associated with higher use of hospice care. The findings suggest increasing palliative and hospice education among physicians so that they can ensure that their patients have high-quality end-of-life medical care in an aging society.

Keywords

palliative education, palliative care, hospice care, end-of-life care, end-stage disease, shared care

Background

The population around the world is aging; in 2019, World Population Prospects revealed that 1 in 11 people will be seniors over 65 years old (about 9%) by 2020 and 1 in 6 people will be older than 65 (about 17%) by 2050.¹ An increasing number of people are dying from cancer and chronic diseases. End-stage patients, including those with cancer, AIDS, heart disease, chronic obstructive pulmonary disease, and kidney disease, experience similar symptoms. In addition to pain, they experience fatigue, anorexia, cachexia, nausea, vomiting, constipation, delirium, and dyspnea.²⁻⁴ Despite continuous advancements and innovations in medical technology, the pain of disease and, ultimately, death is inevitable. In addition to working hard to cure diseases, physicians must also relieve the suffering of patients.⁵ When a patient is fighting a terminal disease, palliative and hospice care are a treatment option that can improve the quality of life of both the patient and their family. Palliative care relieves physical, mental, and spiritual pain and can be combined with invasive, life-prolonging measures.^{6,7} Palliative and hospice care are not universal, with only 35% of countries/regions including it as part of primary care and 37% reporting community or home palliative and hospice care.⁶ Known factors that affect people's acceptance of

¹ Division of Family Medicine, Taipei City Hospital Zhong Xiao Branch, Taipei

² Department of Family Medicine, School of Medicine, National Yang-Ming University, Taipei

³ Department of Internal Medicine, Taipei City Hospital Zhong Xiao Branch, Taipei

⁴ Division of Gastroenterology and Hepatology, Department of Internal Medicine, Taipei City Hospital Zhong Xiao Branch, Taipei

⁵ Department of Nursing, Taipei City Hospital Zhong Xiao Branch, Taipei

⁶ Division of Palliative Medicine, Taipei City Hospital Zhong Xiao Branch, Taipei

⁷ Division of Urology, Taipei City Hospital Zhong Xiao Branch, Taipei

⁸ Department of Urology, National Yang-Ming University School of Medicine, Taipei

⁹ Commission for General Education, College of Applied Science, National Taiwan University of Science and Technology, Taipei

¹⁰ University of Taipei, General Education Center, Taipei

¹¹ Superintendent Office & Division of Neurosurgery, Department of Surgery, Taipei City Hospital, Taipei

¹² Department of Surgery, College of Medicine, National Taiwan University, Taipei

Corresponding Author:

Chih-Ching Lee, MD, Division of Palliative Medicine, Gastroenterology and Hepatology, Department of Internal Medicine, Taipei City Hospital Zhongxiao Branch, No 87, Tongde Road, Nangang District, Taipei City 11556.
Email: dah39@tpech.gov.tw

palliative and hospice care are cancer,⁸ socioeconomic status,^{8,9} race,¹⁰ the cognition and attitude of patients and family members,^{9,11} and physicians' cognitive factors.¹² Physicians' inability to predict the survival period of patients and their lack of knowledge concerning screening out patients who are suitable for palliative and hospice care are the main obstacles.¹² Historically, medical education has rarely emphasized the importance of hospice care.¹³ Only if doctors receive continuing education in palliative and hospice care can their behavior produce lasting changes.¹³ Education for Physicians on End-of-Life Care is an effective tool for communicating palliative treatment to doctors. This kind of education has effectively improved doctors' knowledge and practice of hospice medicine.^{14,15} Taiwan's National Health Insurance (NHI) provides coverage for palliative and hospice care including hospitalization, home care, and shared care (wherein patients remain at the original ward and accept joint care of original and hospice doctors).¹⁶ Among cancer patients who died in 2004 in Taiwan, the use rate of hospice care was approximately 15.4%.¹⁶

Since September 2009, in addition to end-stage cancer and motor neuron disease, 8 other types of diseases have been added to the NHI reimbursement regulation, namely organic psychosis (such as dementia), brain degeneration (such as severe stroke, severe brain injury and other degenerative diseases in the terminal stage), heart failure, chronic airway obstruction diseases, other lung diseases, chronic liver disease and cirrhosis, acute renal failure, and chronic renal failure.¹⁷ In October 2015, Britain's *The Economist* published the results of an evaluation of end-of-life care quality; Taiwan ranked sixth in the world and first in Asia.¹⁸ Taiwan's NHI stipulates that all physicians who declare the various expenses of hospice care must have received palliative and hospice training and education.¹⁶ Since 2014, Taipei City Hospital has organized palliative and hospice education for all its staff. The 13-hour course includes the evaluation and control of end-stage disease symptoms and the psychosocial, spiritual, and religious needs of terminal patients; preparation for discharge; palliative home care; preparation for death; the ethics of decision-making about dying; grief counseling; and follow-up for family members.¹⁹ There is also a 4-hour practice course. All healthcare providers are asked to complete hospice and palliative training before providing hospice care. There was rare study that describes the relationship between doctors' hospice education and their behaviors. Thus, the purpose of this study is to understand whether doctors' hospice and palliative education will be related with the chances of end-of-life hospitalized patients to receive hospice care.

Materials and Methods

Study Design, Participants, and Setting

Electronic medical records in a branch of Taipei City Hospital served as the data source. Underlying diseases were coded according to the World Health Organization's International

Classification of Diseases Ninth Revision Clinical Modification (ICD-9-CM) or Tenth Revision, Clinical Modification (ICD-10-CM).

From January 2014 to December 2019, patients who died in hospital were assigned the following diagnostic codes: malignancy (ICD-9-CM 140-208, ICD-10-CM C00-C97), amyotrophic lateral sclerosis (ALS; ICD-9-CM 335.20, ICD-10-CM G12.21), dementia (ICD-9-CM 290, 294.1, 294.9, 331.0, 331.2, 331.7, 331.89, ICD-10-CM F01-F03, G30, G31.09, G31.83), cerebrovascular disease (ICD-9-CM 430-437, ICD-10-CM, I60-I67, I69), Parkinson's disease (ICD-9-CM 332.0-332.1, ICD-10-CM G20, G21.4, G21.1, G21.11, G21.19, G21.2, G21.3, G21.8, G21.9), heart failure (ICD-9-CM 428.0, 428.1, 428.9, ICD-10-CM I50-I50.9), chronic obstructive pulmonary disease (ICD-9-CM 491.20, 491.21, 492.0, 492.8, ICD-10-CM J43-J44), chronic liver disease and cirrhosis (ICD-9-CM 571.2, 571.5, 571.6, 572.2, 573.4, ICD-10-CM K70, K71.10, K71.11, K72-K74, K76.3), acute renal failure (ICD-9-CM 584.5-584.9, ICD-10-CM N17.0-N17.2, N17.8-N17.9), and chronic renal failure (ICD-9-CM 585-587, ICD-10-CM N18.4-N19, N26.1, N26.9).

The outcome variable was the use of hospice care services, including hospice ward and hospice shared care. The main explanatory variable was physicians' palliative education. The month in which the physician obtained the certificate of hospice and palliative training was regarded as the time of training completion. Based on their physicians' training, the patients were divided into 2 groups: those whose physicians received palliative education—the PE group—and those whose physicians did not receive palliative education—the PNE group.

The control variables included age, gender, and comorbidities. In addition to the inclusion diagnoses, the presence of pneumonia, urinary tract infection, sepsis, hypoglycemia, hyponatremia, cellulitis, as well as diabetes with hyperosmolarity and coma were recorded. Their diagnostic codes are as follows: pneumonia (ICD-9-CM 480.0-487.0, ICD-10-CM J09.X1, J10, J11, J12-J18.9), urinary tract infection (ICD-9-CM 599.0, ICD-10-CM N30.9), sepsis (ICD-9-CM 38.0-38.9, ICD-10-CM A40.0, A41.9, A42.7), hypoglycemia (ICD-9-CM 251.0, 251.1, 251.2, ICD-10-CM E11.641, E16.0, E16.1, E16.2), hyponatremia (ICD-9-CM 276.1, ICD-10-CM E87.1), cellulitis (ICD-9-CM 681.9-682.9, ICD-10-CM L03.1-L03.9), and diabetes with hyperosmolarity and coma (ICD-9-CM 250.20, 250.22, 250.30, 250.32, ICD-10-CM E11.01, E13.01).

Statistical Analysis

Data were reported as mean \pm standard deviation (SD) or n (%), as appropriate. Differences in proportions were tested using the chi-square test, and 2-sample t-tests were used for numerical variables. A 2-tailed statistical test was adopted, and a p-value < 0.05 was regarded as statistically significant. A stepwise multivariate logistic regression was used to estimate the association between physicians' palliative education

Table 1. Characteristics of Deceased Patients Based on the Palliative Care Education of Physicians.

| | Total (N = 2661) | No. (%) of subjects | | p-value |
|-------------------------------------|------------------|---------------------|-----------------|---------|
| | | PE (n = 1632) | PNE (n = 1029) | |
| Sociodemographics | | | | |
| Age in years | | | | |
| Mean \pm SD | 78.2 \pm 13.5 | 78.3 \pm 13.2 | 78.0 \pm 14.0 | 0.63 |
| \leq 39 | 27 (1.0) | 14 (0.9) | 13 (1.3) | 0.22 |
| 40–49 | 70 (2.6) | 35 (2.1) | 35 (3.4) | |
| 50–59 | 184 (6.9) | 121 (7.4) | 63 (6.1) | |
| 60–69 | 341 (12.8) | 204 (12.5) | 137 (13.3) | |
| 70–79 | 559 (21.0) | 350 (21.5) | 209 (20.3) | |
| \geq 80 | 1480 (55.6) | 908 (55.6) | 572 (55.6) | |
| Gender | | | | |
| Male | 1528 (57.4) | 953 (58.4) | 575 (55.9) | 0.2 |
| Female | 1133 (42.6) | 679 (41.6) | 454 (44.1) | |
| Comorbidity | | | | |
| Malignancy | 917 (34.5) | 746 (45.7) | 171 (16.6) | <.01 |
| Dementia | 355 (13.3) | 235 (14.4) | 120 (11.7) | 0.04 |
| Cerebrovascular disease | 718 (27.0) | 366 (22.4) | 352 (34.2) | <.01 |
| Parkinson's disease | 119 (4.5) | 79 (4.8) | 40 (3.9) | 0.26 |
| Heart failure | 751 (28.2) | 341 (20.9) | 410 (39.8) | <.01 |
| Chronic airway obstruction | 316 (11.9) | 245 (15.0) | 71 (6.9) | <.01 |
| Chronic liver disease and cirrhosis | 260 (9.8) | 181 (11.1) | 79 (7.7) | <.01 |
| Acute renal failure | 611 (23.0) | 330 (20.2) | 281 (27.3) | <.01 |
| Chronic renal failure | 672 (25.3) | 329 (20.2) | 343 (33.3) | <.01 |
| Amyotrophic lateral sclerosis | 33 (1.2) | 14 (0.9) | 19 (1.9) | 0.02 |
| Pneumonia | 407 (15.3) | 320 (19.6) | 87 (8.5) | <.01 |
| Urinary tract infection | 52 (2.0) | 19 (1.2) | 33 (3.2) | <.01 |
| Sepsis | 159 (6.0) | 65 (3.4) | 94 (9.1) | 0.8 |
| Hypoglycemia | 36 (1.4) | 17 (1.0) | 19 (1.9) | 0.08 |
| Hyponatremia | 486 (18.3) | 294 (18.0) | 192 (18.7) | 0.68 |
| Cellulitis | 96 (3.6) | 38 (2.3) | 58 (5.6) | <.01 |
| Diabetes with hyperosmolarity coma | 27 (1.0) | 9 (0.6) | 18 (1.8) | <.01 |

PE: Patients' physicians with palliative care education; PNE: Patients' physicians with no palliative care education.

and the use of hospice care. Statistical analysis was conducted using SAS version 9.4 (SAS Institute, Inc., Cary, NC).

Results

A total of 2,661 patients were included in the study, of whom 972 (36.5%) received hospice care. Their basic information is shown in Table 1. The average age of the sample was 78.2 \pm 13.5 years, and there were 1,528 men (57.4%). There was a greater proportion of patients who received palliative and hospice medical care in the PE group than in the PNE group (54.9% and 7.4%, respectively, $p < 0.01$). In terms of personal disease history, there was a greater incidence of the following diseases among the PE group than among the PNE group: cancer (45.7% and 16.6%, $p < 0.01$), dementia (14.4% and 11.7%, $p < 0.01$), chronic obstructive pulmonary disease (15.0% and 6.9%, $p < 0.01$), chronic liver disease and cirrhosis (11.1% and 7.7%, $p < 0.01$), and pneumonia (19.6% and 8.5%, $p < 0.01$), respectively. However, there were significantly more instances of cerebrovascular disease, heart failure, acute renal failure, chronic renal failure, ALS, urinary tract infection, cellulitis, and diabetes with hyperosmolarity and

coma in patients of the PNE group. Table 2 presents the factors related to receiving hospice care.

A stepwise multivariate logistic regression analysis revealed that patients whose attending physicians underwent palliative education had a higher chance of receiving hospice care (OR 14.38, 95% CI 10.90-18.98). Other factors that were associated with a higher chance of receiving hospice care included malignancy (OR 7.17, 95% CI 5.64-9.12), dementia (OR 2.46, 95% CI 1.84-3.30), cerebrovascular disease (OR 1.84, 95% CI 1.40-2.37), heart failure (OR 1.36, 95% CI 1.06-1.75), ALS (OR 2.83, 95% CI 1.11-7.25), and hyponatremia (OR 1.34, 95% CI 1.03-1.74).

Factors that were associated with a lower chance of receiving hospice care included being male (OR 0.80, 95% CI 0.65-0.98) and having acute renal failure (OR 0.76, 95% CI 0.59-0.99), pneumonia (OR 0.48, 95% CI 0.36-0.63), urinary tract infection (OR 0.12, 95% CI 0.03-0.42), and hypoglycemia (OR 0.27, 95% CI 0.08-0.90). When stratified by chronic airway obstruction, patients without chronic airway obstruction who suffered from pneumonia had a reduced chance of receiving hospice care (OR 0.45, 95% CI 0.32-0.62). When stratified by chronic renal

Table 2. Univariate and Multivariate Analysis of Factors Associated With Utilization of Hospice.

| Variables | Number of patients | Utilization of hospice care | Univariate analysis | Multivariate analysis |
|---|--------------------|-----------------------------|----------------------|-----------------------|
| | | n (%) | OR (95% CI) | AOR (95% CI) |
| Completion of hospice care education among physicians | | | | |
| No | 1029 | 76 (7.4) | 1 | 1 |
| Yes | 1632 | 896 (54.9) | 15.27 (11.85-19.66)* | 14.38 (10.90-18.98)* |
| Age in years | | | | |
| <=39 | 27 | 8 (29.6) | 1 | |
| 40-49 | 70 | 21 (30) | 1.02 (0.39-2.69) | |
| 50-59 | 184 | 80 (43.5) | 1.83 (0.76-4.39) | |
| 60-69 | 341 | 132 (38.7) | 1.50 (0.34-3.52) | |
| 70-79 | 559 | 206 (36.9) | 1.39 (0.60-3.22) | |
| >=80 | 1480 | 525 (35.5) | 1.21 (0.27-3.00) | |
| Male | 1528 | 530 (34.7) | 0.83 (0.71-0.97)* | 0.80 (0.65-0.98)* |
| Malignancy | 917 | 614 (67.0) | 7.85 (6.55-9.39) | 7.17 (5.64-9.12)* |
| Dementia | 355 | 159 (44.8) | 1.49 (1.19-1.87) | 2.46 (1.84-3.30)* |
| Cerebrovascular disease | 718 | 197 (27.4) | 0.83 (0.69-1.01) | 1.84 (1.40-2.37)* |
| Parkinson's disease | 119 | 40 (33.6) | 0.88 (0.59-1.29) | |
| Heart failure | 751 | 192 (25.6) | 0.50 (0.41-0.60) | 1.36 (1.06-1.75)* |
| Chronic airway obstruction | 316 | 102 (32.3) | 0.59 (0.49-0.72) | |
| Chronic liver disease and cirrhosis | 260 | 107 (41.2) | 1.24 (0.96-1.61) | |
| Acute renal failure | 611 | 147 (24.1) | 0.47 (0.38-0.58)* | 0.76 (0.59-0.99)* |
| Chronic renal failure | 672 | 187 (27.8) | 0.59 (0.49-0.72)* | |
| Amyotrophic lateral sclerosis | 33 | 9 (27.3) | 0.65 (0.30-1.40) | 2.83 (1.11-7.25)* |
| Pneumonia | 407 | 104 (25.6) | 0.55 (0.43-0.70)* | 0.48 (0.36-0.63)* |
| Urinary tract infection | 52 | 3 (5.8) | 0.10 (0.03-0.33)* | 0.12 (0.03-0.42)* |
| Sepsis | 159 | 28 (17.6) | 0.35 (0.23-0.54)* | |
| Diabetes with hyperosmolarity coma | 27 | 4 (14.8) | 0.30 (0.10-0.87)* | |
| Hypoglycemia | 36 | 4 (11.1) | 0.21 (0.08-0.61)* | 0.27 (0.08-0.90)* |
| Hyponatremia | 486 | 168 (34.6) | 0.90 (0.72-1.12) | 1.34 (1.03-1.74)* |
| Cellulitis | 96 | 25 (26.0) | 0.60 (0.38-0.96)* | |

Care services among deceased patients. OR: Odds ratio; AOR: Adjusted odds ratio; CI: Confidence interval.

Table 3. Sensitivity Analysis of the Associations Between Physicians' Hospice Education and the Utilization of Hospice Care Services, Adjusting for Patient Characteristics.

| Study subgroups | Utilization of hospice care services AOR (95% CI) |
|--------------------------------------|---|
| All patients (n = 2,661) | |
| Physicians with hospice education | 14.38 (10.90-18.98) |
| Physicians without hospice education | 1 |
| Male patients (n = 1,528) | |
| Physicians with hospice education | 12.77 (8.76-18.62) |
| Physicians without hospice education | 1 |
| Female patients (n = 1,133) | |
| Physicians with hospice education | 14.81 (9.96-22.02) |
| Physicians without hospice education | 1 |

AOR: Adjusted odds ratio; CI: Confidence interval.

failure, patients without chronic renal failure who had acute renal failure showed a reduced chance of receiving hospice care (OR 0.59, 95%CI 0.43-0.82) (Supplementary Table 1). Table 3 shows the sensitivity analysis based on gender. Among men as well as women, patients of the PE group had a higher chance of receiving hospice care (OR 12.77, 95% CI 8.76-18.62 and OR 14.81, 95% CI 9.96-22.02, respectively).

Discussion

Main Findings

This study included 2,661 patients, of whom 36.5% received hospice care. After adjusting for age, gender, and comorbidities, physicians who underwent hospice and palliative education were found to increase the chances that hospitalized patients would opt for hospice care at the end of life. Studies have found that the most common obstacle to hospice treatment is the unwillingness of physicians to refer patients to hospice specialists, followed by physicians' lack of knowledge about which types of patients are suitable for hospice treatment²⁰ and their lack of interest, knowledge, and skills in hospice care.²¹ In the past few years, the fields of hospice and palliative medicine have developed rapidly.^{22,23} Hospice education continues to expand. Medical students, clerks, interns, residents, and attending physicians are required to undergo training courses. The Taipei City Hospital organizes many hospice and palliative education training programs every year.²⁴ Some studies have found that the implementation of education and training programs will significantly improve the level of medical knowledge of hospice and palliative care.²⁵ In this study, cancer patients constituted the highest proportion of those using

palliative care (67.0%), followed by those with dementia (44.8%), and those with chronic liver disease (41.2%). Taiwan's NHI covers hospitalization, home care, and shared care for hospice and palliative care.²⁴ However, concerning non-cancer end-stage patients, several physicians and families of patients generally believe in the concept of rescue, even if the patients are in intensive care units; do-not-resuscitate orders are not signed until all therapeutic options have been exhausted.^{26,27} According to data from the National Health Insurance Agency in 2014, about 96% of Taiwan's hospice care services were provided to cancer patients.²⁴ Considering the needs of the large aging population, non-cancer patients should also receive high-quality end-of-life care.

What This Study Adds

In this study, those with a lower chance of receiving hospice medical care included men and patients with acute renal failure, pneumonia, urinary tract infections, and hypoglycemia. The reason men had a lower chance than women of receiving hospice care can be attributed to the fact that men were most likely the breadwinners of the family and may have still been receiving monthly pensions. According to the stratification analysis, among patients without chronic airway obstruction, doctors and family members preferred active treatment for those who suffered from pneumonia because they had a better chance of being cured. Thus, they had a reduced chance of receiving hospice care (OR 0.45, 95% CI 0.32-0.62). Moreover, because the NHI pays for hemodialysis for patients without chronic renal failure, doctors and family members preferred active treatment for those who suffered acute renal failure (OR 0.59, 95%CI 0.43-0.82) (Supplementary Table 1).

Elderly people with chronic diseases are often hospitalized repeatedly in the years before dying, for reasons such as fever and weakness. Pneumonia, urinary tract infection, and hypoglycemia are also common causes of hospitalization. Usually, when patients are hospitalized due to an acute condition, antibiotics and other medication can be used until the cure fails. Therefore, the chance of receiving hospice care is reduced. To improve this situation, it is necessary to enhance the awareness of medical staff and the public so that timely recommendations for providing hospice and palliative treatment can be made to ensure proper care for patients at the end of life. The implementation of education and training programs among physicians will significantly improve the level of medical knowledge of hospice and palliative care, thereby leading to better quality of care for end-of-life patients.

Strengths and Limitations

Our study had several strengths, including providing insights into a novel issue (i.e., doctors' hospice education and their behaviors), considering a significant number of comorbidities to adjust for multiple confounders, and having studied patients for a period of 6 years. However, failing to consider religion, educational level, and cognition of patients and their family

members may be one of the limitations to this study. Moreover, the subjects of a hospital are not representative of all patients, thus limiting the generalizability of our results to all terminal patients.

Implications for Current Practice

The implementation of education and training programs among physicians will significantly improve the level of medical knowledge of hospice and palliative care, thereby leading to better quality of care for end-of-life patients.

Conclusion

From 2014 to 2019, the use of palliative care among patients with end-stage diseases who were admitted to the Taipei City Hospital was approximately 36.5%. This study found an association between physicians' palliative education and use of hospice care services. Physician palliative education was found to be an independent factor associated with greater use of hospice care services. This finding could help inform hospital policies and encourage doctors and other medical staff to undergo palliative care training so that they can guide their patients holistically, especially toward the end of their lives. Thus, it is recommended that physicians receive palliative and hospice education so that they can provide high-quality end-of-life medical care in an aging society. Further research is needed to test the effects of religion and cognition of patients and their family members on hospice care use.

Authors' Note

For the data used for the analysis, please contact the lead author. This study was approved by the Human Research Ethics Review Committee of Taipei City Hospital (Case No: TCHIRB-10811001-E).

Acknowledgments

We would like to express our gratitude to Dr. Kuo-Meng Liao, Dr. I-Mo Fang, Dr. Wen-Jung Sun, Dr. Yung-Feng Yen, Mr. Gu-Jun Lin, and Ms. Yan-Xi Lai for their help.


Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

ORCID iD

Mei-Hsing Chuang  <https://orcid.org/0000-0002-3193-5146>

Supplemental Material

Supplemental material for this article is available online.

References

1. United Nations. World Population Prospects. Published 2019. Accessed September 24, 2020. <https://population.un.org/wpp/>

2. Douglas DR, Carla SA. Management of common symptoms in terminally ill patients: part I. fatigue, anorexia, cachexia, nausea and vomiting. *Am Fam Physician*. 2001;64(5):807-814.
3. Fischer J. Palliating symptoms other than pain. *Aust Fam Physician*. 2006;35(10):766-770.
4. Solano JP, Gomes B, Higginson IJ. A comparison of symptom prevalence in far advanced cancer, AIDS, heart disease, chronic obstructive pulmonary disease and renal disease. *J Pain Symptom Manage*. 2006;31(1):58-69.
5. Cassell EJ. The nature of suffering and the goals of medicine. *N Engl J Med*. 1982;306(11):639-645.
6. World Health Organization. Palliative care for noncommunicable diseases: a global snapshot. Published 2019. Accessed September 24, 2020. <https://apps.who.int/iris/bitstream/handle/10665/326385/WHO-NMH-NVI-19.7-eng.pdf?sequence=1&isAllowed=y>
7. Sullivan MF, Kirkpatrick JN. Palliative cardiovascular care: the right patient at the right time. *Clin Cardiol*. 2020;43(2):205-212.
8. Lai YJ, Chen YY, Ko MC, et al. Low socioeconomic status associated with lower utilization of hospice care services during end-of-life treatment in patients with cancer: a population-based cohort study. *J Pain Symptom Manage*. 2020;60(2):309-315.e1.
9. O'Mahony S, McHenry J, Snow D, Cassin C, Schumacher D, Selwyn PA. A review of barriers to utilization of the Medicare hospice benefits in urban populations and strategies for enhanced access. *J Urban Health*. 2008;85(2):281-290.
10. Rosenfeld P, Dennis J, Hanen S, et al. Are there racial differences in attitudes toward hospice care? A study of hospice-eligible patients at the Visiting Nurse Services of New York. *Am J Hosp Palliat Care*. 2007;24(5):408-416.
11. Chindapasirt J, Wongtirawit N, Limpawattana P, et al. Perception of a "good death" in Thai patients with cancer and their relatives. *Heliyon*. 2019;5(7):e02067.
12. Brickner L, Scannell K, Marquet S, Ackerson L. Barriers to hospice care and referrals: survey of physicians' knowledge, attitudes, and perceptions in a health maintenance organization. *J Palliat Med*. 2004;7(3):411-418.
13. Downar J. Resources for educating, training, and mentoring all physicians providing palliative care. *J Palliat Med*. 2018;21(S1):S57-S62.
14. Robinson K, Sutton S, von Gunten CF, et al. Assessment of the education for physicians on End-of-Life Care (EPEC) Project. *J Palliat Med*. 2004;7(5):637-645.
15. Inoue A, Yamaguchi T, Keiko Tanaka K, et al. Benefits of a nationwide palliative care education program on lung cancer physicians. *Intern Med*. 2019;58(10):1399-1403.
16. Tang ST, Chen ML, Huang EW, et al. Hospice utilization in Taiwan by cancer patients who died between 2000 and 2004. *J Pain Symptom Manage*. 2007;33(4):446-453.
17. National Health Insurance. Palliative care services open to terminally ill non-cancer patients in eight newly added categories, officially covered by National Health Insurance since September 1st, 2009. Published 2019. Accessed September 24, 2020. https://www.nhi.gov.tw/english/News_Content.aspx?n=996D1B4B5DC48343&sms=F0EAFEB716DE7FFA&s=37BA73280DCC9628
18. The Economist Intelligence Unit. Quality of death index [In]. Published 2015. Accessed September 24, 2020. <https://www.eiuperspectives.economist.com/healthcare/2015-quality-death-index>
19. Taipei City Hospital. Palliative care education and training course. Published 2015. Accessed September 24, 2020. <http://www.taclip.org.tw/index.php/forum/8/463-104>
20. Feeg VD, Elebiary H. Exploratory study on end-of-life issues: barriers to palliative care and advance directives. *Am J Hosp Palliat Care*. 2005;22(2):119-124.
21. Miyashita M, Sanjo M, Morita T, et al. Barriers to providing palliative care and priorities for future actions to advance palliative care in Japan: a nationwide expert opinion survey. *J Palliat Med*. 2007;10(2):390-399.
22. Case AA, Orrange SM, Weissman DE. Palliative medicine physician education in the United States: a historical review. *J Palliat Med*. 2013;16(3):230-236.
23. Yao CA, Chiu TY, Hu WY, et al. Current state of hospice palliative medical education in developed countries and Taiwan. *Taiwan J Hospice Palliat Care*. 2004;9(1):28-43.
24. Huang CM, Shih HC, Liu CJ, et al. Community hospice service analysis in Taipei city hospital: current status and future needs estimate. *Taipei City Med J*. 2015;12(SP):9-20.
25. Tsai LY, Li IF, Liu CP, et al. The study for the effect of Natural Death Act educational program. *Taiwan J Hos Palliat Care*. 2003;8(4):364-380.
26. Tsai YS, Lin YL, Huang SJ. End-of-life care in critical illness. *Taiwan J Hos Palliat Care*. 2007;12(3):312-320.
27. Huang YC, Huang SJ, Ko WJ. Survey of do-not-resuscitate orders in surgical intensive care units. *J Formos Med Assoc*. 2010;109(3):201-208.