



Utilization of End-of-Life Care Rooms by Patients Who Died in a Single Hospice Unit at a National University Hospital in South Korea

Gyu Lee Kim, M.D.*[†], Seung Hun Lee, M.D., Ph.D.*[†], Yun Jin Kim, M.D., Ph.D.*^{†,‡},
Jeong Gyu Lee, M.D., Ph.D.*^{†,‡}, Yu Hyeon Yi, M.D., Ph.D.*^{†,‡}, Young Jin Tak, M.D., Ph.D.*^{†,‡},
Young Jin Ra, M.D.*[†], Sang Yeoup Lee, M.D., Ph.D.^{§,||}, Young Hye Cho, M.D., Ph.D.^{‡,||},
Eun Ju Park, M.D.^{||}, Young In Lee, M.D.^{||}, Jung In Choi, M.D.^{||},
Sae Rom Lee, M.D.^{||}, Ryuk Jun Kwon, M.D.^{||} and Soo Min Son, M.D.^{||}

*Department of Family Medicine, Pusan National University Hospital,

[†]Biomedical Research Institute, Pusan National University Hospital, Busan,

[‡]Department of Family Medicine, Pusan National University School of Medicine,

[§]Department of Medical Education, Pusan National University School of Medicine,

^{||}Department of Family Medicine, Pusan National University Yangsan Hospital, Yangsan, Korea

Purpose: For the dignity of patients nearing the end of their lives, it is essential to provide end-of-life (EoL) care in a separate, dedicated space. This study investigated the utilization of specialized rooms for dying patients within a hospice unit. **Methods:** This retrospective study examined patients who died in a single hospice unit between January 1, 2017, and December 31, 2021. Utilizing medical records, we analyzed the circumstances surrounding death, the employment of specialized rooms for terminally ill patients, and the characteristics of those who received EoL care in a shared room. **Results:** During the 1,825-day survey period, deaths occurred on 632 days, and 799 patients died. Of these patients, 496 (62.1%) received EoL care in a dedicated room. The average duration of using this dedicated space was 1.08 days. Meanwhile, 188 patients (23.5%) died in a shared room. Logistic regression analysis revealed that a longer stay in the hospice unit was associated with a lower risk of receiving EoL care in a shared room (odds ratio [OR]=0.98, 95% confidence interval [CI] 0.97~0.99; P=0.002). Furthermore, a higher number of deaths on the day a patient died was associated with a greater risk of receiving EoL care in a shared room (OR=1.66, 95% CI 1.33~2.08; P<0.001). **Conclusion:** To ensure that more patients receive EoL care for an adequate duration in a private setting, additional research is necessary to increase the number of dedicated rooms and incorporate them into the hospice unit at an early stage.

Key Words: Death, Terminal care, Hospice care, Palliative care, Neoplasms, Bereavement

Received February 13, 2023

Revised April 10, 2023

Accepted April 26, 2023

Correspondence to

Seung Hun Lee

ORCID:

<https://orcid.org/0000-0002-0976-8708>

E-mail: greatseunghun@daum.net

Funding/Support

This work was supported by 2022

Research Grant of Pusan National University Hospital.

INTRODUCTION

According to 2020 data from Statistics Korea, the total number of deaths in Korea reached 304,948, representing an

increase of 9,838 (3%) from the previous year [1]. This rise in annual deaths is primarily due to the aging population, resulting in a growing demand for end-of-life (EoL) care [2]. The EoL process typically involves gathering family members to

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

share their emotions and mourn, which serves as a catalyst for their subsequent recovery and return to daily life following the bereavement [3]. Notably, the location where individuals spend their final hours significantly impacts the quality of life for both patients and their families, with most patients preferring to be at home [4,5]. However, according to Statistics Korea's data on births and deaths in 2021, 74.8% of deaths occurred in medical institutions, while only 16.5% took place in residences [6]. Consequently, most patients died in hospitals, and home-based deaths were relatively rare. When receiving EoL care in a hospital, private rooms can help prevent emotional disturbances that may arise in other patients during the dying process, compared to shared rooms. Additionally, private rooms offer enhanced privacy, preserve the patient's dignity, facilitate visitations, and foster smooth interactions with medical staff [7,8]. As a result, both patients and their families tend to prefer receiving EoL care in private spaces.

Hospice palliative care encompasses EoL care, which aims to comprehensively alleviate the suffering of patients and their families during the dying process [9]. In Korea, when a hospice unit is established, it is required to designate a separate, private space as an EoL room, regardless of the bed capacity [10]. Furthermore, patients undergoing the EoL process can stay in these dedicated rooms for up to 3 days without incurring additional charges for a higher-level ward [11]. However, there has been a lack of research investigating the utilization of EoL rooms within hospice units in Korea. Therefore, this study aimed to provide suggestions on how to optimize the use of EoL rooms by examining the location where EoL care was administered and the duration of EoL room usage for patients who died in a hospice unit.

METHODS

1. Study design

This retrospective study aimed to examine the utilization of the EoL rooms in a hospice ward.

2. Study sample

The subjects for this study were selected based on electronic medical records of patients who died between January 1, 2017,

and December 31, 2021, in a hospice unit of a national university hospital. All patients provided informed consent for inpatient hospice care and for the suspension or discontinuation of life-sustaining treatment, in accordance with the guidelines outlined in the Act on Hospice and Palliative Care and Decisions on Life-Sustaining Treatment for Patients at the End of Life. According to this law, a dying patient is defined as an individual who has received a medical evaluation from both the attending physician and a specialist, confirming that the patient has no potential for recovery; who does not recover despite treatment; and who is in a state of imminent death due to rapid deterioration. The hospital in this study has a total bed capacity of 1,300, with the hospice unit comprising 16 shared rooms, one single room, and one dedicated room for the EoL process. In shared rooms, four patients occupy the same space, with each patient accompanied by a caregiver. Curtains are installed between the patients to provide a degree of privacy. A single room is occupied by one patient and one caregiver; it is used when a patient chooses to pay for a higher-level hospital room, when isolation is required due to infection or delirium, or when the dedicated room for EoL care is unavailable. The dedicated room functions as a separate space specifically designed for EoL care once the patient has entered the EoL process. Although there is no precise definition of an EoL room, previous studies have shown that medical staff and bereaved family members prefer EoL care in a private space to maintain the dignity of the dying patient. Additionally, hospice unit operational guidelines also designate it as a distinct space [10]. Therefore, this study defined an EoL room as a private room within the hospital exclusively intended for EoL care. In line with internal guidelines, the attending professor and physician evaluate whether the patient is in the dying process and then direct them to the EoL room. If the patient displays symptoms and signs suggestive of nearing the end of life, the unit nurse informs the attending physician and subsequently transfers the patient to the EoL room.

3. Data collection

This study received approval from the institutional review board of B University Hospital (2206-021-116) and aimed to investigate various patient factors by requesting electronic medical data. The factors examined included age, sex, diagno-

sis, mental status, and overall condition upon admission to the hospice unit, as well as the type of hospital room where EoL care was received, length of stay in the hospice unit, duration of EoL room usage, date of death, and whether other patients used the EoL room at the time of death. To ensure the privacy of patients, personal identification information was encrypted when securely accessing the necessary data from the hospital's electronic records. The mental status of each patient was categorized as alert, drowsy, semi-coma, or coma, based on the information documented in the nursing reports. The patient's overall condition was assessed using the Eastern Cooperative Oncology Group (ECOG) performance status score, as documented in the nursing reports. The ECOG is measured on a scale from 0 to 5, with a higher score indicating a worse level of activity. Grade 0 signifies that the patient is asymptomatic and fully active; Grade 1 means the patient is symptomatic but able to perform light work or activity; Grade 2 shows that the patient is symptomatic and spends less than 50% of the day in bed or in a chair; Grade 3 reveals that the patient spends more than 50% of the day in bed or in a chair; Grade 4 denotes that the patient is bedbound; and Grade 5 indicates death. The hospital rooms in which patients received EoL care were identified through electronic records of the rooms where dying patients were discharged. These rooms were categorized into dedicated rooms, single rooms, and shared rooms. To determine the duration of EoL room usage, both the date of death and the date of admission to the EoL room were utilized. Throughout the entire survey period, the date of death for each patient was recorded, and the total number of deaths was calculated daily. If multiple study subjects shared the same date of death, the count was set to the number of patients who died on that specific day. For patients who received EoL care in a shared room, if electronic records indicated that another patient was using the EoL room on the date of death, the reason for not receiving EoL care in a private space was defined as "lack of dedicated rooms," while all other cases were categorized as "others."

4. Data analysis

We investigated the characteristics of the subjects, the types of rooms in which patients died, the length of stay in the hospice unit, the duration of EoL room usage, and the reasons

for not receiving EoL care in a private space. Furthermore, we performed mean and frequency analyses for the entire study period, focusing on the number of deaths by date, the number of deaths for each specific date of death, and the number of patients who died on the same date as the subject. To identify the characteristics of patients who did not receive EoL care in a private space, we conducted additional analyses targeting patients who received EoL care in an EoL room and those who received EoL care in a shared room. Patients who died in a single room were excluded from further analyses, as it was challenging to differentiate between those who were transferred to a single room for EoL care and those who were already in a single room prior to the EoL process. For the additional analyses, the t-test and chi-square test were conducted for two groups, comparing age, sex, diagnosis, mental status, and general condition upon admission to the hospice unit, duration of stay in the hospice unit, and the number of patients who died on the same date as the subject. Among these variables, mental status was divided into two categories: alert and drowsy or below, while ECOG grades were separated into grade 2 or lower and grade 3 or higher. Logistic regression analysis was carried out with the receipt of EoL care in a shared room as the dependent variable. All statistical analyses were conducted using SPSS version 27 (SPSS Inc., IBM Corp., Armonk, NY, USA), with a statistical significance level set at a P-value <0.05.

RESULTS

1. General characteristics of the subjects

From January 1, 2017 to December 31, 2021, there were 954 new hospitalizations, with an average of 9.5 patients hospitalized and a total of 799 patient deaths. The mean age of deceased patients was 69.73 years (± 11.92), with men (n=468; 58.6%) outnumbering women. Upon admission, 668 patients (83.6%) were alert, 120 (15.0%) were drowsy (stupor), 10 (1.3%) were in a semi-coma, and one (0.1%) was in a coma. The ECOG performance status was utilized to evaluate the overall condition of patients in the study. Out of all patients, six (0.8%) were classified as grade 1, 147 (18.4%) as grade 2, 327 (40.9%) as grade 3, and 317 (39.7%) as grade 4; the ma-

jectory were in grade 3 or higher, indicating a decline in their general health. In terms of primary cancer sites, 125 patients (15.6%) had lung cancer, followed by colorectal cancer in 91 patients (11.4%), stomach cancer in 86 (10.8%), and pancreatic cancer in 75 (9.4%). The mean duration of stay in the hospice unit for all deceased patients was 16.53 ± 14.43 days (Table 1).

2. Statistics on the occurrence of deaths in hospice units

During the 1,825-day survey period, death occurred on 632

days (34.6%), with an average of $0.44 (\pm 0.68)$ patients dying per day in the hospice unit. On the 632 days when deaths occurred, the average number of dying patients per day was $1.26 (\pm 0.55)$. Out of the dates when deaths occurred, 138 (21.8%) had two or more deaths. The average number of patients who died on the same date as the subject was 1.5 patients (± 0.74), and there were 305 patients (38.2%) who had two or more patients die on the same date (Table 2).

Table 1. Characteristics of Subjects (N=799).

Characteristics	Mean \pm SD (range) or n (%)
Age (yr)	69.73 \pm 11.92 (26~102)
Sex	
Male	468 (58.6)
Female	331 (41.4)
Mental status	
Alert	668 (83.6)
Drowsy-stupor	120 (15.0)
Semicoma	10 (1.3)
Coma	1 (0.1)
ECOG score	
1	6 (0.8)
2	147 (18.4)
3	327 (40.9)
4	317 (39.7)
Censored data	2 (0.3)
Tumor type	
Stomach	86 (10.8)
Colorectal	91 (11.4)
Lung	125 (15.6)
Liver	30 (3.8)
Breast	51 (6.4)
Cervix	16 (2.0)
Prostate	18 (2.3)
Pancreas	75 (9.4)
Biliary	65 (8.1)
Kidney	27 (3.4)
Hematological	9 (1.1)
Bladder	26 (3.3)
Ovary	39 (4.9)
Esophagus	15 (1.9)
Head and neck	32 (4.0)
etc.	94 (11.8)
Length of stay (days)	16.53 ± 14.43 (0~85)

ECOG: Eastern Cooperative Oncology Group.

Table 2. Mortality Statistics of the Hospice Unit (N=799).

Variables	Mean \pm SD (range) or n (%)
Investigation period (days)	1,825
Total number of deaths during investigation period	799
Number of deaths per day	0.44 ± 0.68 (0~5)
Number of deaths on day the patient died	1.26 ± 0.55 (1~5)
Number of days the patient died (days)	632
Number of days 1 patient died (days)	494 (78.2)
Number of days 2 patients died (days)	113 (17.9)
Number of days 3 patients died (days)	22 (3.5)
Number of days 4 patients died (days)	2 (0.3)
Number of days 5 patients died (days)	1 (0.2)
Number of patients who died on the same date	1.5 ± 0.74 (1~5)
Number of patients who died alone	494 (61.8)
Number of patients with 2 deaths on the same date	226 (28.3)
Number of patients with 3 deaths on the same date	66 (8.3)
Number of patients with 4 deaths on the same date	8 (1.0)
Number of patients with 5 deaths on the same date	5 (0.6)

Table 3. Status of End-of-Life Care in Hospice Unit (N=799).

Status of end-of-life care	Mean \pm SD or n (%)
Place of end-of-life care	
Dedicated room for dying patients	496 (62.1)
Single room	115 (14.4)
Shared room	188 (23.5)
Period of use of the dedicated room for dying patients (days)	1.08 ± 2.53
1 day of use	255 (51.4)
2 days of use	151 (30.4)
3 days of use	41 (8.3)
4 days of use	23 (4.6)
More than 4 days of use	26 (5.24)
Reasons for receiving end-of-life care in a shared room	
Insufficient number of dedicated rooms	103 (54.8)
Other	85 (45.2)

3. Status of end-of-life care

Regarding the location of EoL care, 496 patients (62.1%) received care in a dedicated room for dying patients, 115 (14.4%) in a single room, and 188 (23.5%) in a shared room. The average duration of EoL room usage was 1.08 ± 2.53 days. Of those, 255 (51.4%) used the dedicated room for less than 1 day, 151 (30.4%) for 2 days, 41 (8.3%) for 3 days, 23

(4.6%) for 4 days, and 26 patients (5.2%) for more than 4 days. Among the 188 patients who died in a shared room, 103 patients (54.8%) were unable to use a private space due to the unavailability of a dedicated room, representing 12.9% of the total 799 dying patients (Table 3).

Table 4. Characteristics of Subjects Who Died in a Dedicated Room or a Shared Room (N=684).

Characteristics	Mean \pm SD (range) or n (%)		P value
	Dedicated room for dying patients (n=496)	Shared room (n=188)	
Age (yr)	70.46 \pm 11.63 (27~102)	69.64 \pm 11.77 (26~95)	0.412
Sex			
Male	281 (56.7)	115 (61.2)	0.285
Female	215 (43.3)	73 (38.8)	
Mental status			
Alert	430 (87.0)	147 (80.3)	0.029
Drowsy-coma	64 (13.0)	36 (19.7)	
ECOG			
1~2	108 (20.8)	28 (15.1)	0.092
3~4	393 (79.2)	158 (84.9)	
Censored data	0	2	
Tumor type			
Stomach	61 (12.3)	14 (7.4)	0.104
Colorectal	60 (12.1)	22 (11.7)	
Lung	66 (13.3)	40 (21.3)	
Liver	19 (3.8)	7 (3.7)	
Breast	26 (5.2)	16 (8.5)	
Cervix	10 (2)	5 (2.7)	
Prostate	10 (2)	7 (3.7)	
Pancreas	48 (9.7)	15 (8)	
Biliary	40 (8.1)	15 (8)	
Kidney	18 (3.6)	3 (1.6)	
Hematological	7 (1.4)	0 (0)	
Bladder	18 (3.6)	2 (1.1)	
Ovary	25 (5)	9 (4.8)	
Esophagus	7 (1.4)	5 (2.7)	
Head and neck	20 (4)	7 (3.7)	
Other	61 (12.3)	21 (11.2)	
Length of stay (days)	18.42 \pm 14.62 (0~85)	13.38 \pm 14.19 (0~71)	<0.001
Number of patients who died on the same date	1.42 \pm 0.68 (1~5)	1.68 \pm 0.86 (1~5)	<0.001
Number of patients who died alone	334 (67.3)	97 (51.6)	<0.001
Number of patients with 2 deaths on the same date	125 (25.2)	63 (33.5)	
Number of patients with 3 deaths on the same date	30 (6)	22 (11.7)	
Number of patients with 4 deaths on the same date	5 (1)	3 (1.6)	
Number of patients with 5 deaths on the same date	2 (0.4)	3 (1.6)	

ECOG: Eastern Cooperative Oncology Group.

Table 5. Odds Ratios and 95% Confidence Intervals from the Logistic Regression Models for the Risk of Receiving End-of-Life Care in a Shared Room.

Variables	OR	95% CI	P value
Age (yr)	0.99	0.98~1.01	0.265
Sex	0.86	0.60~1.23	0.402
Mental status (alert)	0.67	0.42~1.09	0.109
ECOG score <3	0.91	0.56~1.48	0.708
Number of patients who died on the same day	1.66	1.33~2.08	<0.001
Length of stay	0.98	0.96~0.99	0.002

OR: odds ratio, CI: confidence interval, ECOG: Eastern Cooperative Oncology Group.

4. Characteristics of patients according to the location of end-of-life care

There were no differences in age, sex, or diagnosis between patients who received EoL care in a shared room and those who received EoL care in a dedicated room. Among the patients who received EoL care in a shared room, 80.3% were alert upon admission to the hospice unit, which was significantly lower than the 87% in the dedicated room. The average length of stay in hospice units was 13.38 ± 14.19 days in a shared room, significantly shorter than the 18.42 ± 14.62 days in the dedicated EoL room. The mean number of patients who died on the same date was 1.68 ± 0.86 , significantly higher than the 1.42 ± 0.68 patients who died in the dedicated room. The rate of two or more patients dying on the same date was also significantly higher in shared rooms (48.4%) compared to dedicated rooms (32.7%) (Table 4). Logistic regression analysis, with EoL status in a shared room as the dependent variable, showed that the more patients who died on the same date, the higher the risk of receiving EoL care in a shared room (odds ratio [OR]=1.66, 95% confidence interval [CI] 1.33~2.08; $P < 0.001$). Additionally, the longer the hospice unit was used, the lower the risk of EoL care in a shared room (OR=0.98, 95% CI 0.97~0.99; $P = 0.002$) (Table 5).

DISCUSSION

To assess the current state of dedicated room usage, this study analyzed medical records from a hospice unit in a national university hospital, focusing on the location of EoL care, the duration of dedicated room usage, and patient character-

istics. Among all dying patients, 23.5% did not receive EoL care in a separate space, and over half of these cases (54.8%) were attributed to an insufficient number of dedicated rooms. Research on dedicated room usage in hospice units is scarce. In a multicenter survey of bereaved families of hospice unit patients in Japan, it was discovered that 8.6% of patients were unable to die in a private space, suggesting that the autonomy of dying patients was better maintained compared to the results of this study [12]. In the specific institution where this research took place, there are 17 operational hospital beds, with one dedicated room allocated in accordance with hospice unit operation standards. During the 1,825-day survey period, deaths occurred on 632 days, representing only 34.6% of the entire period, with a mean daily death rate of 0.4 patients. This mathematical assessment suggests that there is no shortage of available dedicated rooms. However, when examining the data based on the actual date of death, the mean daily death rate was 1.26 ± 0.55 , and two or more deaths occurred per day on 138 days (21.8%), indicating that there were numerous instances when the dedicated rooms could not be used due to their limited availability. Logistic regression also showed that a high number of patients who died on the same day was associated with the risk of EoL care in a shared room. Furthermore, once the decision for the EoL process has been made for a patient and the patient enters the dedicated room, EoL care is provided for several days until the actual death, making it impossible for other patients to use the dedicated room during that period. Consequently, it becomes essential to assess whether the current EoL operation standard, which involves operating one dedicated room regardless of the number of beds, is sufficient. A comprehensive approach is needed to determine the optimal number of dedicated rooms based on factors such as the total number of beds, bed utilization rate, annual patient mortality rate, and the appropriate EoL care duration.

In this study, we found that the average duration of EoL care in the dedicated room was 1.08 ± 2.53 days, which was significantly shorter than the institutionally guaranteed period of 3 days. Moreover, more than half of the patients (51.4%) used the room for one day or less. These findings are notably different from a previous study conducted at an Australian tertiary hospital [13], which reported that the mean usage

duration of the Lotus Room, a separate space designated for EoL care, was 2.37 ± 1.3 days. Our study confirms that the results obtained were less than half of those reported in the Australian study. A patient in the process of dying is defined as someone whose condition deteriorates within days or weeks, and death is anticipated. It is during this time that discussions about implementing EoL care should specifically take place [14]. Although there are no clear criteria for the timing and duration of appropriate EoL care, guidelines provided by the National Institute for Health and Care Excellence suggest that EoL care should be initiated for patients who are expected to die within 2~3 days [15]. In a qualitative study focusing on improving EoL care, bereaved families expressed a desire to spend more time in a private space during EoL care [16]. Although no previous studies have explored the reasons for the decreasing duration of EoL care in dedicated rooms, clinical observations suggest that limited room availability and delayed assessment of the EoL process by medical staff may contribute to this trend. In a typical hospice unit, the physician in charge or attending physician determines if a patient is in the dying process based on signs such as Cheyne–Stokes breathing and terminal wheezing, as well as the patient’s overall condition assessed using the Palliative Performance Scale. Once the decision is made, the patient is transferred to a dedicated room for EoL care [17]. A study examining the accuracy of prognosis prediction made by medical staff revealed that both physicians and nurses tended to overestimate life expectancy. Physicians demonstrated greater accuracy in predicting survival at the 6-month mark, whereas nurses were more accurate in predicting survival within 24 or 48 hours [18]. Previous studies comparing the prognosis prediction accuracy of multidisciplinary teams, including both physicians and nurses, with the predictions made by medical staff alone, reported accuracy rates of 57.5%, 56.3%, and 55.5% respectively; the prediction accuracy of the multidisciplinary teams was higher than either physicians or nurses working alone [19]. Therefore, it is anticipated that if the traditional approach of relying on physicians for end-of-life process judgment is supplemented with a multidisciplinary team approach involving both doctors and nurses, the accuracy of prognostic predictions will increase, leading to earlier determination and notification of the end-of-life process.

In this study, patients who did not receive EoL care in a private room and passed away in a shared room had a shorter admission period to the hospice unit compared to patients who received EoL care in a dedicated room. Logistic regression analysis demonstrated that a longer hospitalization period in the hospice unit correlated with a lower risk of receiving EoL care in a shared room. To ensure EoL care is provided in a private room, it is essential to initiate discussions about death with patients and their families once the decision regarding the EoL process has been made by medical staff. However, inaccurate predictions of a patient’s survival, delays in assessing the EoL process, or insufficient conversations with the patient and their family may result in missing the ideal moment to transfer the patient to the dedicated EoL room. Since a patient’s survival period prediction may vary based on changes in their symptoms and signs at the beginning and after admission, it is necessary to conduct repeated assessments [20]. In a previous study that compared the accuracy of physicians and nurses in predicting patient prognosis at weekly intervals, both groups tended to overestimate the survival period. However, as the frequency of measurements increased, their predictions became closer to the actual survival period [21]. Patients with shorter hospice unit stays have relatively fewer opportunities for prognostic predictions, which can result in lower accuracy. Overestimating life expectancy by medical staff may further delay transfers to dedicated EoL rooms. Moreover, medical staff often face barriers when discussing EoL matters with patients and their families due to factors such as lack of knowledge and education, cultural differences, and family rejection [22,23]. To overcome patient and family resistance, it is essential to establish relationships through ongoing communication and personalized approaches [24]. A shorter hospice unit stay may hinder EoL discussions because there is not enough time to form relationships between physicians and patients/families. Therefore, it is crucial to expedite transfers to hospice units to enable accurate prognosis prediction and ensure sufficient time to establish relationships with patients and their families.

This study has several limitations. First, due to its retrospective nature and reliance on electronic data analysis, we were unable to determine the exact reasons why patients did not receive EoL care in private units, as well as the specific locations of primary cancer and metastasis that might be associated with

sudden death. Prospective studies are needed to explore factors such as the assessment of the EoL process, reasons for choosing a place for EoL care, and the factors contributing to sudden death. Second, this study was conducted in the hospice unit of a single tertiary hospital, and the mean length of stay for the subjects was 16.53 days, which was similar to the mean of 15.1 days in general tertiary hospitals but significantly lower than the mean of 26.6 days for all healthcare institutions [25]. This makes it difficult to generalize the results of the study. In the future, it is necessary to conduct a multicenter study involving various healthcare institutions that operate inpatient hospice units. Despite these limitations, this study is the first to investigate the utilization of dedicated EoL rooms within hospice units in Korea. The strengths of this study lie in its ability to highlight the need for follow-up research on the installation standards of the dedicated EoL rooms, the appropriateness of their usage duration, and the multidisciplinary prognosis prediction. This study also offers valuable insights into enhancing the practical utilization rate of the dedicated rooms, such as early patient transfer to hospice units and optimizing their duration of use.

In this study carried out in a hospice unit of a university hospital, 23.5% of dying patients did not receive EoL care in a separate space. The likelihood of not receiving EoL care privately was greater for patients with a shorter duration of hospitalization and when the number of patients who passed away on the same day was higher. For those who received EoL care in a dedicated EoL room, the duration of care was frequently shorter than anticipated, typically less than one day. Further research and efforts are necessary to establish more dedicated EoL rooms and promote early connections to hospice units, allowing a greater number of patients to receive EoL care for an adequate amount of time.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

ORCID

Gyu Lee Kim, <https://orcid.org/0000-0003-2825-0629>
 Seung Hun Lee, <https://orcid.org/0000-0002-0976-8708>
 Yun Jin Kim, <https://orcid.org/0000-0002-0204-3253>
 Jeong Gyu Lee, <https://orcid.org/0000-0001-7160-0714>
 Yu Hyeon Yi, <https://orcid.org/0000-0002-1786-2737>
 Young Jin Tak, <https://orcid.org/0000-0002-4645-5866>
 Young Jin Ra, <https://orcid.org/0000-0001-9663-4806>
 Sang Yeoup Lee, <https://orcid.org/0000-0002-3585-9910>
 Young Hye Cho, <https://orcid.org/0000-0003-2176-6227>
 Eun Ju Park, <https://orcid.org/0000-0003-2415-8243>
 Young In Lee, <https://orcid.org/0000-0003-0141-7484>
 Jung In Choi, <https://orcid.org/0000-0003-3832-3393>
 Sae Rom Lee, <https://orcid.org/0000-0003-3736-3393>
 Ryuk Jun Kwon, <https://orcid.org/0000-0001-7757-7412>
 Soo Min Son, <https://orcid.org/0000-0002-0165-7480>

AUTHOR'S CONTRIBUTIONS

Conception or design of the work: GLK, SHL, YJK, YHY, YHC, SYL, JIC, SMS. Data collection: GLK, SHL, JGL. Data analysis and interpretation: SHL, YJT, YJR, YIL. Drafting the article: GLK, SHL, EJP, SRL, RJK. Critical revision of the article: SHL. Final approval of the version to be published: SHL.

SUPPLEMENTARY MATERIALS

Supplementary materials can be found via <https://doi.org/10.14475/jhpc.2023.26.2.60>.

REFERENCES

1. Statistics Korea. Causes of death statistics in 2020 [Internet]. Daejeon: Statistics Korea; 2021 [cited 2023 Mar 12]. Available from: https://kostat.go.kr/board.es?mid=a20108010000&bid=11773&act=view&list_no=414516&tag=&nPage=1&ref_bid=11742,11743,11744,11745,11746,11747,11748,11749,11773,11774,11750&keyField=&keyWord=cause.
2. Dasch B, Blum K, Gude P, Bausewein C. Place of death: trends over the course of a decade: A population-based study of death certificates

- from the years 2001 and 2011. *Dtsch Arztebl Int* 2015;112:496–504.
3. Rabow MW, Hardie GE, Fair JM, McPhee SJ. End-of-life care content in 50 textbooks from multiple specialties. *JAMA* 2000;283:771–8.
 4. Gomes B, Higginson IJ, Calanzani N, Cohen J, Deliens L, Daveson BA, et al. Preferences for place of death if faced with advanced cancer: a population survey in England, Flanders, Germany, Italy, the Netherlands, Portugal and Spain. *Ann Oncol* 2012;23:2006–15.
 5. Yun YH, Rhee YS, Nam SY, Chae YM, Heo DS, Lee SW, et al. Public attitudes toward dying with dignity and hospice palliative care. *J Hospice Palliat Care* 2004;7:17–28.
 6. Statistics Korea. Preliminary results of birth and death statistics in 2021 [Internet]. Daejeon: Statistics Korea; 2022 [cited 2022 Jul 4]. Available from: https://kostat.go.kr/board.es?mid=a10301010000&&bid=204&act=view&list_no=416897.
 7. Attia AK, Abd-Elaziz WW, Kandeel NA. Critical care nurses' perception of barriers and supportive behaviors in end-of-life care. *Am J Hosp Palliat Care* 2013;30:297–304.
 8. van de Glind I, van Dulmen S, Goossensen A. Physician-patient communication in single-bedded versus four-bedded hospital rooms. *Patient Educ Couns* 2008;73:215–9.
 9. Tatum PE. End-of-life care: Hospice care. *FP Essent* 2020;498:26–31.
 10. Ministry of Health and Welfare. Hospice palliative care 2021 [Internet]. Sejong: MOHW; 2021 [cited 2023 Jan 11]. Available from: http://www.mohw.go.kr/react/jb/sjb030301vw.jsp?PAR_MENU_ID=03&MENU_ID=032901&CONT_SEQ=363986.
 11. Ministry of Health and Welfare. Notice No. 2020-187 of the Ministry of Health and Welfare 2020 [Internet]. Sejong: MOHW; 2020 [cited 2023 May 15]. Available from: http://www.mohw.go.kr/react/jb/sjb0406vw.jsp?PAR_MENU_ID=03&MENU_ID=030406&page=1&CONT_SEQ=359212.
 12. Otani H, Morita T, Igarashi N, Shima Y, Miyashita M. Private or shared room? A nationwide questionnaire survey on bereaved family members' perceptions of where patients spend their last days. *BMJ Open* 2022;12:e055942.
 13. Slatyer S, Pienaar C, Williams AM, Proctor K, Hewitt L. Finding privacy from a public death: a qualitative exploration of how a dedicated space for end-of-life care in an acute hospital impacts on dying patients and their families. *J Clin Nurs* 2015;24:2164–74.
 14. Lee SM, Kim SJ, Choi YS, Heo DS, Baik S, Choi BM, et al. Consensus guidelines for the definition of the end stage of disease and last days of life and criteria for medical judgment. *J Korean Med Assoc* 2018;61:509–21.
 15. National Clinical Guideline Centre for Acute and Chronic Conditions (Great Britain): Royal College of Physicians of London: Royal College of Surgeons of England: Royal College of General. *Care of dying adults in the last days of life*. London: National Institute for Health and Care Excellence; 2015.
 16. Bussmann S, Muders P, Zahrt-Omar CA, Escobar PL, Claus M, Schildmann J, et al. Improving end-of-life care in hospitals: a qualitative analysis of bereaved families' experiences and suggestions. *Am J Hosp Palliat Care* 2015;32:44–51.
 17. White N, Harries P, Harris AJ, Vickerstaff V, Lodge P, McGowan C, et al. How do palliative care doctors recognise imminently dying patients? A judgement analysis. *BMJ Open* 2018;8:e024996.
 18. Hui D, Kilgore K, Nguyen L, Hall S, Fajardo J, Cox-Miller TP, et al. The accuracy of probabilistic versus temporal clinician prediction of survival for patients with advanced cancer: a preliminary report. *Oncologist* 2011;16:1642–8.
 19. Gwilliam B, Keeley V, Todd C, Roberts C, Gittins M, Kelly L, et al. Prognosticating in patients with advanced cancer – observational study comparing the accuracy of clinicians' and patients' estimates of survival. *Ann Oncol* 2013;24:482–8.
 20. Maltoni M, Caraceni A, Brunelli C, Broeckeaert B, Christakis N, Eychmueller S, et al. Prognostic factors in advanced cancer patients: evidence-based clinical recommendations—a study by the Steering Committee of the European Association for Palliative Care. *J Clin Oncol* 2005;23:6240–8.
 21. Chen PY, Huang CH, Peng JK, Yeh SY, Hung SH. Prediction accuracy between terminally ill patients' survival length and the estimations made from different medical staff, a prospective cohort study. *Am J Hosp Palliat Care* 2023;40:440–6.
 22. Travers A, Taylor V. What are the barriers to initiating end-of-life conversations with patients in the last year of life? *Int J Palliat Nurs* 2016;22:454–62.
 23. Laryionava K, Winkler EC. Dealing with family conflicts in decision-making in end-of-life care of advanced cancer patients. *Curr Oncol Rep* 2021;23:124.
 24. Walczak A, Henselmans I, Tattersall MH, Clayton JM, Davidson PM, Young J, et al. A qualitative analysis of responses to a question prompt list and prognosis and end-of-life care discussion prompts delivered in a communication support program. *Psychooncology* 2015;24:287–93.
 25. Oh JY, Lee DH, Im JW, Shin YJ, Park DH, Yoo HL, et al. Hospice and palliative care services system improvement plan [Internet]. Wonju: Health Insurance Review & Assessment Service; 2020 [cited 2023 Mar 10]. Available from: <https://repository.hira.or.kr/handle/2019.oak/2259>.