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Living Will Completion During Palliative Care Consultations and Factors Influencing Completion: A Retrospective Study in a University Hospital

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ABSTRACT

OBJECTIVE To determine the proportion of palliative care patients completing a living will and to identify factors associated with completion.

METHODS This retrospective study analyzed electronic medical records from Maharaj Nakorn Chiang Mai Hospital, a university hospital in Thailand. Patients who had their initial palliative care consultations between November 1, 2021 and April 30, 2022 were included. Descriptive statistics and multivariable logistic regression were used.

RESULTS Of the 389 patients in the study, 205 (52.7%) were female, and the median age was 68 (IQR: 59–79). Most had cancer (67.6%) and poor performance status (PPS 10–30: 69.9%). Decision-making capacity was present in 177 patients (45.5%). A living will was introduced to 83 patients (21.3%) and was completed by 26 (6.7%). Higher PPS (70–100) was associated with being introduced to a living will. The most common reason for not introducing patients to a living will was poor patient symptom control. No factors were significantly associated with living will completion among those who were introduced to a living will.

CONCLUSIONS Most patients presented to palliative care with advanced disease and poor performance status, limiting opportunities for living will discussions and emphasizing the need for early consultation. Strengthening symptom management may support earlier and more frequent introduction of a living will, potentially improving completion rates.

KEYWORDS living will, completion, palliative care, university hospital

INTRODUCTION

Healthcare providers play a crucial role in delivering appropriate palliative care to patients with incurable illnesses (1). The World Health Organization (WHO) defines palliative care as an approach that improves the quality of life of patients facing life-threatening illness and their families (2). A living will (LW) is an important tool in palliative care, allowing patients to express their end-of-life treatment preferences to healthcare providers and family members. A LW is a written document specifying an individual's wishes for medical treatment in circumstances where they are no longer able to provide informed consent (3). It empowers patients to refuse unnecessary or burdensome interventions, thereby preserving their right to a dignified and peaceful death. Beyond medical decisions, a LW also facilitates emotional and spiritual preparation for death, offering patients the opportunity to reflect on life, say goodbye to loved ones, and accept the impermanence of human existence (4). Legally, everyone has the right to their own living will, and from a clinical perspective, it is recommended that ideally all palliative patients complete one (5, 6).

In Thailand, the National Health Act of 2007 legally supports end-of-life decision-making, allowing individuals to record a LW in which they can refuse life-prolonging or suffering-relieving treatments. Implementation follows ministerial regulations, and healthcare providers complying with a valid LW are exempt from legal liability (7).

In clinical practice in Thailand, however, most patients referred to the palliative care team do not have a LW (8). Supporting patients in preparing for their inevitable death and facilitating the completion of their own LW is usually a responsibility of the palliative care team. This facilitation process generally involves three sequential steps: (1) the attending healthcare provider evaluates whether the patient has the decision-making capacity to complete a LW; (2) the attending provider introduces the LW to the patient; and (3) the provider offers additional information the patient may require to make informed decisions regarding making a LW. The process is carried out in accordance with the patient's individual pace and often requires more than one encounter. Completion of a LW at the end of consultations is not mandatory, though it is preferred.

This study aimed to examine the proportion of LW completions during first palliative care consultations in a university hospital in Thailand and to address the lack of quantitative data on LW implementation in Thai university hospitals as well as the need to explore physician- and system-related barriers. These findings could help inform palliative care teams regarding how to systematically improve the LW facilitation process in the future.

To operationalize this aim, the study focused on the following objectives, building on the LW facilitation process described above.

1. Examine the proportion of patients progressing through each step of the facilitation process, specifically:
    a) Patients assessed to have decision-making capacity for LW completion
    b) Patients to whom the palliative care team introduced a LW
    c) Patients who ultimately completed a LW
2. Identify clinical and demographic factors associated with:
    a) The decision by the palliative care team to introduce a LW to patients with decision-making capacity
    b) The completion of a LW by patients to whom LW was introduced
3. Explore reasons why with some patients who were assessed as having decision-making capacity the palliative care team chose not to introduce a LW to the patient.

METHODS

Study design

This is a retrospective observational study. All data were extracted from electronic medical records (EMR) of Maharaj Nakorn Chiang Mai Hospital, Thailand.

Setting

All data were obtained from records of in-patient department consultations. All physicians' notes were recorded within the EMR system. Regarding the LW, after the physician introduced the concept including an explanation of its purpose and the steps involved in completing it:

a) If the patient wished to proceed, the LW was completed using the hospital's standardized note template and documented in the EMR.

b) If the patient was interested but not ready to make treatment decisions during the current admission, the palliative care team provided LW information to appropriate hospital staff for review and arranged follow-up either at the outpatient clinic or by coordinating referral to a nearby hospital.

c) If the patient declined to make a LW, no further LW discussions were initiated during that admission.

Sample calculations

The sample size was estimated using the formula for a single proportion, based on the following assumptions: an expected proportion of LW completion of 30.0% among first palliative consultations (9), a 95% confidence level, and a 5% margin of error. The minimum required sample size was 323 patients.

Ethics approval

This study was approved by Research Ethics Committee, Faculty of Medicine, Chiang Mai University (Study Code: FAM-2564-08503/28th October 2021).

Study population

Inclusion criteria

All patients who were referred for consultation with the palliative care team between November 1, 2021, and April 30, 2022.

Exclusion criteria

1. Patients who had previously been consulted by the palliative care team
2. Patients younger than 18 years
3. Patients who already had a LW prior to the consultation.

Data collection

Patient health information was extracted from the EMR. Variables included sex, age, type of health insurance, type of primary diagnosis (cancer vs. non-cancer), comorbid conditions (chronic non-life-threatening diseases), Palliative Performance Status (PPS) (10, 11), a validated score reflecting an individual's ability to perform daily activities, fulfill normal roles, and maintain health and well-being, Pain Numeric Rating Scale (12), Dyspnea Numeric Rating Scale (13), history of receiving interventions including endotracheal intubation, cardiopulmonary resuscitation, hemodialysis, and central venous catheter insertion, and data on whether advance care planning (ACP) (14)—defined as decisions regarding general treatment direction but not limited to LW—which had been documented by the consulting physician prior to referral to the palliative care team were also extracted from the EMR.

Outcome variables included

1. Whether the attending palliative care team deemed the patient to have decision-making capacity for LW completion
2. Whether the concept of LW was introduced to the patient
3. Whether the patient completed a LW

Decision-making capacity was defined as the ability to: (1) understand and retain relevant information, (2) appreciate the situation and its likely consequences, (3) reason and weigh options rationally, and (4) communicate a choice (15). These assessments were made solely by the attending team based on clinical judgment guided by this definition.

Reasons for not introducing a LW to eligible patients were also collected from the EMR. At the time of the study, the palliative care team required physicians to document reasons for not introducing a LW to patients.

Statistical analysis

Analyses were conducted in three stages:

1. Descriptive statistics (means, medians, frequencies, and proportions, as appropriate) were used to summarize patient characteristics and outcomes in each group of patients throughout the LW facilitation process (had decision-making capacity, LW was introduced, LW completion). Proportions of patients progressing through each step were reported. Among patients with decision-making capacity, demographic and clinical factors were compared between those who were and were not introduced to LW using t-tests, chi-square tests, or Fisher's exact tests, depending on data type. Similarly, among patients introduced to LW, comparisons were made between those who completed and those who did not complete a LW.
2. Univariable and multivariable logistic regression analyses were used to identify demographic and clinical factors associated with the introduction of LW among patients with decision-making capacity, and LW completion by those to whom LW was introduced. Both unadjusted and adjusted associations were examined.
3. Reasons documented by the palliative care team for not introducing LW to eligible patients were summarized descriptively.

RESULTS

Between 1 November 2021 and 30 April 2022, the palliative care team received a total of 429 patients. Of those patients, 177 had decision-making capacity. LW was introduced to 83 of those patients, of whom 26 completed a LW during their hospital stay (Figure 1).

Among 389 new patients referred to the palliative care team at Maharaj Nakorn Chiang Mai Hospital during the six-month period of this study, 205 were female (52.7%). The median age

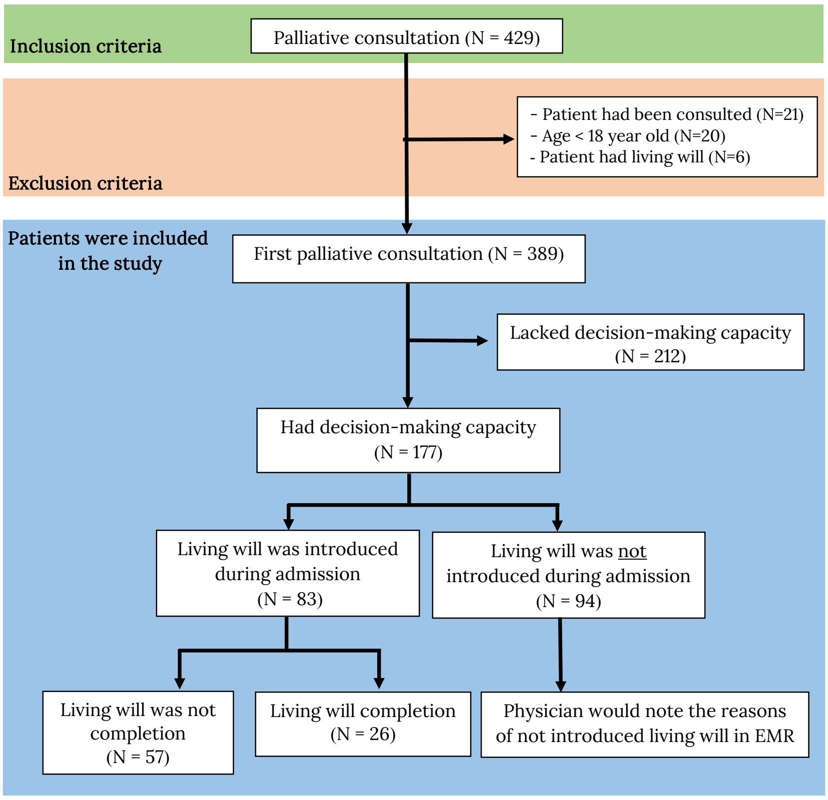

Figure 1. Patient recruitment flow diagram

was 68 years. A total of 182 patients were covered by the Civil Servant Medical Benefit Scheme (46.8%), 263 had cancer (67.6%), and 240 had at least one co-morbidity disease (61.7%). ACP was documented in 262 patients (67.4%). Most patients (272, 69.9%) had PPS of 10-30. Pain was absent in 249 patients (64.0%), and dyspnea was absent in 160 patients (41.1%). A total of 177 patients (45.5%) were assessed as having decision-making capacity. Of these, 93 were female (52.5%), with a median age of 64 years. Eighty-eight patients (49.7%) were covered under the Universal Health Coverage scheme (UHC), 162 had cancer (91.5%), and 98 had at least one co-morbidity disease (55.4%). ACP was documented in 92 patients (52.0%). Most patients (95, 53.7%) had PPS of 40-60. Pain was absent in 65 patients (36.7%), and dyspnea was absent in 82 patients (46.3%).

Eighty-three patients (21.3% of all included patients, or 46.9% of those with decision-making capacity) were invited to complete a LW. This group included 46 females (55.4%) and 43 patients (51.8%) younger than 65 years. The majority were covered under UHC (40 patients, 48.2%), and most had cancer (79 patients, 95.2%). Forty-three patients (51.8%) had at least one co-morbidity. More than half (47 patients, 56.6%) had had no discussions of ACP. Most had PPS of 40-60 (50 patients, 60.2%), experienced moderate pain (28 patients, 33.7%), and reported no dyspnea (43 patients, 51.8%).

Twenty-six patients (6.7% of all included patients, or 31.3% of those with decision-making capacity) completed a LW. This group included 15 females (57.7%) and 15 patients younger than 65 years (57.7%). Nearly half were covered by the Civil Servant Medical Benefit Scheme (12 patients, 46.2%), and all had cancer (100.0%). Fourteen patients (53.8%) had at least one co-morbidity. More than half (15 patients, 57.7%) had not discussed ACP. Most had PPS of 40-60 (17 patients, 65.4%), experienced moderate pain (11 patients, 42.4%), and reported no dyspnea (13 patients, 50.0%) (Table 1).

Among the 177 patients, factors associated with being introduced to a LW were examined using logistic regression. In the univariable analysis, ACP was associated with lower odds of a LW introduction (OR = 0.52, 95%CI: 0.29-0.95, p = 0.032), while higher PPS was strongly associated with increased odds of an introduction. Compared with patients with PPS 10-30, those with

Table 1. Participant characteristics

	First consultation	Had decision-making capacity	LW introduced	LW completed
N (%)	389 (100.0)	177 (45.5)	83 (21.3)	26 (6.7)
				
Variables				
Female, n (%)	205 (52.7)	93 (52.5)	46 (55.4)	15 (57.7)
Age, median [Q1, Q3]	68.0 [59.0, 79.0]	64.0 [56.0, 70.0]	64.0 [57.0, 68.0]	63.5 [57.0,67.0]
Age group ≥ 65 years old, n (%)	230 (59.1)	81 (45.8)	40 (48.2)	11 (42.3)
Insurance, n (%)				
Civil servant	182 (46.8)	70 (39.5)	35 (42.2)	12 (46.2)
UHC	153 (39.4)	88 (49.7)	40 (48.2)	10 (38.5)
Social security	27 (6.9)	15 (8.5)	6 (7.2)	3 (11.5)
Other	27 (6.9)	4 (2.3)	2 (2.4)	1 (3.8)
Cancer as primary diagnosis, n (%)	263 (67.6)	162 (91.5)	79 (95.2)	26 (100.0)
Had at least one co-morbidity disease, n (%)	240 (61.7)	98 (55.4)	43 (51.8)	14 (53.8)
Had ACP discussed, n (%)	262 (67.4)	92 (52.0)	36 (43.4)	11 (42.3)
PPS, n (%)				
10-30	272 (69.9)	68 (38.4)	20 (24.1)	5 (19.2)
40-60	102 (26.2)	95 (53.7)	50 (60.2)	17 (65.4)
70-100	15 (3.9)	14 (7.9)	13 (15.7)	4 (15.4)
Pain, n (%)				
None	249 (64.0)	65 (36.7)	26 (31.3)	5 (19.2)
Mild	31 (8.0)	23 (13.0)	13 (15.7)	5 (19.2)
Moderate	63 (16.2)	50 (28.3)	28 (33.7)	11 (42.4)
Severe	46 (11.8)	39 (22.0)	16 (19.3)	5 (19.2)
Dyspnea, n (%)				
None	160 (41.1)	82 (46.3)	43 (51.8)	13 (50.0)
Mild	58 (14.9)	29 (16.4)	13 (15.7)	5 (19.2)
Moderate	74 (19.1)	37 (20.9)	16 (19.3)	3 (11.6)
Severe	97 (24.9)	29 (16.4)	11 (13.2)	5 (19.2)

UHC, The Universal Health Coverage scheme; ACP, advance care planning; LW, living will

Table 2. Factor associated with introducing LW in patients who had decision-making capacity

Characteristics (n = 177)	Univariable			Multivariable		
	OR	95% CIs	*p*-value	OR	95% CIs	*p*-value
Female	1.24	0.69, 2.25	0.471	1.34	0.68, 2.65	0.396
Age group ≥ 65	1.20	0.67, 2.18	0.542	1.78	0.84, 3.77	0.136
Non-civil servant	0.81	0.45, 1.49	0.503	0.55	0.27, 1.13	0.104
Had at least one co-morbidity disease	0.76	0.42, 1.38	0.371	0.43	0.21, 0.90	0.025
Had ACP discussed	0.52	0.29, 0.95	0.032	0.58	0.28, 1.19	0.139
PPS						
10-30	Ref.					
40-60	2.67	1.38, 5.15	0.004	3.38	1.60, 7.11	0.001
70-100	31.20	3.82, 254.73	0.001	49.77	5.40, 459.05	0.001
Pain						
None	Ref.					
Mild	1.95	0.75, 5.10	0.174	1.57	0.53, 4.63	0.415
Moderate	1.91	0.90, 4.03	0.090	2.20	0.92, 5.28	0.077
Severe	1.04	0.47, 2.34	0.918	0.91	0.36, 2.31	0.837
Dyspnea						
None	Ref.					
Mild	0.74	0.32, 1.73	0.482	0.86	0.33, 2.28	0.763
Moderate	0.69	0.32, 1.51	0.354	1.14	0.47, 2.81	0.768
Severe	0.55	0.23, 1.32	0.182	0.86	0.31, 2.36	0.766

ACP, advance care planning; PPS, palliative care performance status

Table 3. Factors associated with LW completed among patients who were introduced for LW

Characteristics (n = 83)	Univariable			Multivariable		
	OR	95% CIs	*p*-value	OR	95% CIs	*p*-value
Female	1.14	0.45, 2.92	0.779	1.37	0.48, 3.93	0.563
Age group ≥ 65	0.71	0.28, 1.80	0.469	0.87	0.28, 2.68	0.807
Non-civil servant	0.79	0.31, 2.01	0.620	0.72	0.22, 2.34	0.584
Had at least one co-morbidity disease	1.13	0.45, 2.85	0.802	1.46	0.46, 4.60	0.519
Had ACP discussed	0.94	0.37, 2.40	0.895	1.57	0.44, 5.63	0.491
PPS						
10-30	Ref.					
40-60	1.55	0.48, 4.98	0.466	1.84	0.49, 6.97	0.368
70-100	1.33	0.28, 6.30	0.717	1.88	0.32, 11.14	0.485
Pain						
None	Ref.					
Mild	2.63	0.60, 11.57	0.202	3.39	0.67, 17.19	0.140
Moderate	2.72	0.79, 9.35	0.113	4.05	0.93, 17.62	0.063
Severe	1.91	0.45, 8.04	0.378	1.98	0.37, 10.60	0.424
Dyspnea						
None	Ref.					
Mild	1.44	0.40, 5.26	0.579	1.25	0.31, 5.02	0.750
Moderate	0.53	0.13, 2.19	0.382	0.38	0.07, 1.95	0.246
Severe	1.92	0.50, 7.44	0.344	2.24	0.47, 10.61	0.311
History interventions	0.84	0.28, 2.49	0.753	1.09	0.30, 3.95	0.892

LW, living will; ACP, advance care planning; PPS: palliative care performance status

PPS 40-60 had over twofold higher odds (OR = 2.67, 95%CI: 1.38-5.15, p = 0.004), and those with PPS 70-100 had markedly higher odds (OR = 31.20, 95%CI: 3.82-254.73, p = 0.001) of an introduction to a LW.

In the multivariable analysis, PPS remained the only significant predictor of introduction to a LW. Patients with PPS 40-60 (OR = 3.38, 95%CI: 1.60-7.11, p = 0.001) and PPS 70-100 (OR = 49.77, 95%CI: 5.40-459.05, $p < 0.001$) were substantially more likely to be introduced LW than those with PPS 10-30. Conversely, having at least one co-morbidity disease was independently associated with lower odds of LW introduction (OR = 0.43, 95%CI: 0.21-0.90, p = 0.025). Other factors, including sex, age ≥ 65 years, having health insurance, having discussed ACP, and pain, and dyspnea, were not significantly associated with LW introduction (Table 2). The characteristics of patients who had decision-making capacity are provided in Supplementary material: Table 1.

Among the 83 patients, no demographic or clinical characteristics were statistically significantly associated with LW completion. In the multivariable analysis, moderate pain demonstrated a trend toward higher odds of LW completion (OR = 4.05, 95%CI: 0.93-17.62, p = 0.063), although this did not reach statistical significance. Other factors, e.g., female gender (OR = 1.37, p = 0.563), age ≥ 65 years (OR = 0.87, p = 0.807), PPS 40-60 (OR = 1.84, p = 0.368), PPS 70-100 (OR = 1.88, p = 0.485), and dyspnea (OR range: 0.38-2.24, all $p >$ 0.24), were likewise not statistically significantly associated with LW completion (Table 3). The characteristics of participating patients who were introduced to LW are provided in Supplementary material: Table 2.

The predominant reason for not introducing a LW was that 67 physicians (69.1%) perceived the patient was experiencing severe distress symptoms, which the physician considered likely to interfere with their decision-making capacity. Additionally, 6 (6.2%) reported that the patient was not informed of their diagnosis due to a conspiracy of silence; in the case of 5 patients (5.1%) although there had been a plan to propose completion of a LW, the patient had been discharged from the hospital before this could take place. These findings represent responses from 94 physicians who were able to provide more than one reason (Table 4).

Table 4. Reasons for not introducing a LW (N = 94)

Reasons	N (%)
1. The patient was not informed of their diagnosis due to a conspiracy of silence	6 (6.2)
2. The patient was not informed of their diagnosis, as they expressed a preference not to know	2 (2.1)
3. The patient's family declined discussions on the matter, despite the patient being aware of their diagnosis	2 (2.1)
4. Although the patient was aware of their diagnosis, they chose not to participate in treatment planning, instead delegating treatment decisions to their family	4 (4.1)
5. The patient was experiencing severe distressing symptoms, which the physician considered likely to interfere with their decision-making capacity	67 (69.1)
6. A plan had been made to propose the completion of a living will; however, the patient was discharged from the hospital before this could take place	5 (5.1)
7. The physician was not comfortable proposing the completion of a living will to this patient	1 (1.0)
8. Others	10 (10.3)
Total	97 (100.0)

Responses from 94 physicians. One physician could give multiple responses
The reasons of others included factors such as the physician not having enough time to talk, the patient still needing more information before making a treatment decision, and the setting being unsuitable for such a discussion, among others.

DISCUSSION

In this study of 389 patients who had received a first palliative care consultation, the majority were older adults with cancer, had low PPS, and lacked decision-making capacity. A LW was introduced to 21.3% of eligible patients, but only 6.7% of all patients completed one during admission. Among patients who had decision-making capacity and who were introduced to a LW, the completion rate was 31.3% which is comparable to findings in previous studies that reported completion rates of around 20.0-55.0% (3, 9, 16-19). The rate varied depending on the population and the context being studied.

Based on these results, more than half the patients lacked decision-making capacity, indicating that palliative care is often initiated too late, particularly in the case of patients with non-cancer terminal illnesses, where palliative care typically begins when the patient is already in the final stages (20). If these patients and their families were engaged in palliative care discussions and planning from the early stages, it could allow more time for ACP and decision-making (21, 22). This finding aligns with previous studies suggesting that if individuals have adequate time to prepare for the end of life, they may engage in a process of achieving a sense of completion or closure (4) and that to reduce inequalities in end-of-life care, timely actions to promote ACP are essential (3).

Among the 177 patients who had sufficient decision-making capacity to complete a LW, logistic regression showed that those with higher PPS (70-100) were significantly more likely to be introduced to LW by healthcare professionals, whereas the presence of at least one co-morbidity disease was associated with a lower odds ratio after adjustment. These findings highlight the importance of initiating palliative care consultations early, before functional decline and multiple comorbidities develop, in order to increase the rate of LW completion. Consistent with Steinhauser et al. (4), many physicians hesitate to discuss end-of-life planning due to concerns about causing distress, perceptions of medical failure, or fear of diminishing hope; however, patients often wish to plan their funerals and to know the expected timing of death. For example, the use of tools such as Supportive & Palliative Care Indicators Tool (SPICT) (23) can support timely initiation of palliative care. The study by Huang et al. (24) demonstrated that SPICT facilitates clinical teams in initiating palliative care consultations, engaging in goals-of-care discussions, and making appropriate referrals for patients in routine practice.

The present study found that factors such as sex, age, health insurance, having at least one co-morbidity disease, having ACP discussed, PPS, pain, dyspnea, or a history of receiving interventions were not statistically significantly associated with the decision to complete a LW. This finding contrasts with previous studies (3, 9, 16, 25-28). For example, Andreasen et al. (3) studied 10,178 older adults receiving long-term care in Finland and found that female sex ($p < 0.001$), having a proxy decision-maker (p = 0.001), higher age (p = 0.003), reduced functional capacity (activities of daily living hierarchy, $p < 0.001$), lower Cognitive Performance Scale scores ($p < 0.001$), unstable health status (changes in health, end-stage disease and signs and symptoms, $p < 0.001$), and proximity to death ($p < 0.001$) were significantly associated with having a LW. Similarly, Muneeno et al. (16) examined 180 cancer patients attending tertiary-hospital outpatient clinics in Bangkok and reported that older age (≥ 60 years), advanced cancer stage, symptom severity, and knowledge of LW increased the likelihood of LW completion (OR = 2.63, 7.59, 1.05, and 1.79, respectively; $p < 0.05$). These results may be due to the population context and the number of patients included in the study.

Among the 94 patients who had decision-making capacity but who were not introduced to LW by physicians, the most common reason was that the patients were experiencing severe distress symptoms that physicians believed could interfere with decision-making capacity (69.1%). The second most common reason was that patients were unaware of their diagnosis due to a "conspiracy of silence" (6.2%). The conspiracy of silence is common in Thai culture, often driven by familial desire to protect the patient from distress or bad news (29-31). This highlights that, apart from the patients' clinical condition, one of the key factors influencing the opportunity to complete a LW is the physician's assessment of the patient's readiness. If physicians are able to more appropriately assess symptoms and evaluate readiness for ACP, patients experiencing distressing symptoms may still be able to participate in discussions and complete a LW. This aligns with the findings of Saimmai et al. (31), who examined the challenges faced by Thai general practitioners and family physicians in discussing advanced care planning. They reported barriers including limited knowledge of palliative care, difficulties in symptom management, and insufficient communication skills. This aligns with previous studies by Omondi et al. (27) which stated that discussions about death and dying are considered taboo in most African societies, and the study by Steinhauser et al. (4) which noted that preparation for the end of life, particularly in terms of predicting timing, is often hindered by discomfort, skill deficits, and ambiguity regarding the definition of end of life. Furthermore, initiating conversations about death and dying can evoke discomfort among clinicians due to feelings of failure or fear of removing hope.

In reality, many patients may wish to discuss these matters but are simply waiting for physicians to initiate the conversation (4, 32) because patients wish to make their own healthcare decisions, which is consistent with previous studies by Mezey et al., (26) that the patients desire to make independent decisions regarding their own care (92.0%), the belief that clarifying their wishes would benefit their family (89.0%), and the wish to avoid being sustained by invasive measures such as tubes, wires, or prolonged coma care (81.0%). Therefore, early identification and referral criteria (e.g., using SPICT or symptom-based triggers), along with training programs for physicians and nurses to enhance their communication skills and confidence in initiating ACP or LW discussions, should be implemented.

Lastly, if the government plays a more active role in promoting public awareness and implementing policies regarding ACP and palliative care, along with encouraging community participation, it could significantly enhance public understanding and increase the completion rates of LW (9, 27, 32).

CONCLUSIONS

Most patients presented to palliative care with advanced disease and lacked decision-making capacity. Among patients with decision-making capacity, one key factor associated with physicians not introducing a LW is low PPS, further highlighting the importance of earlier referral to palliative care, which may lead to an increased LW completion rate. Strengthening physicians' skills in symptom management could also increase the proportion of patients introduced to LW, thereby improving the proportion of LW completions.

Limitations of the study

As this is a retrospective EMR-based study, there is an inherent risk of documentation bias. However, there was no missing data because a standardized data entry protocol was implemented. All reported variables were mandatory for assessment and documentation in the EMR. In addition, physicians had been trained and provided with standardized recording guidelines to minimize bias, although some residual bias may still exist.

Collecting data solely from patients who have been referred to the palliative care team at Maharaj Nakorn Chiang Mai Hospital may be insufficient for identifying factors influencing the completion of a LW. Expanding the survey to other units to allow patients earlier access to LW discussions may increase the amount of data collected regarding physical, psychological, and other factors.

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CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

AUTHOR CONTRIBUTIONS

T.R.: conceptualization, methodology, data collection, analysis, writing—review and editing; T.U.: conceptualization, methodology, data collection, analysis; N.B.: supervision, writing—review and editing; W.J.: supervision, writing—review and editing; N.D.: supervision, writing—review and editing; N.V.: data collection, analysis; T.C.: data collection; A.B.: data collection; C.A.: conceptualization, methodology, data collection, analysis, writing—review and editing.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

INSTITUTIONAL REVIEW BOARD STATEMENT

The study was conducted in accordance with the Declaration of Helsinki and approved by the Research Ethics Committee of Faculty of Medicine, Chiang Mai University (Study Code: FAM-2564-08503/28th October 2021).

INFORMED CONSENT STATEMENT

Patient consent was waived because the study involved no more than minimal risk.

DECLARATION OF GENERATIVE AI IN SCIENTIFIC WRITING

Declaration of Generative AI and AI-assisted technologies in the writing process

The authors used ChatGPT 5 to enhance the clarity and language of the manuscript during its preparation. All content was subsequently reviewed and edited by the authors, who take full responsibility for the final published version.

SUPPLEMENTARY MATERIALS

The following supporting information can be downloaded at: Supplementary file

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Supplementary materials

Table 1. Participant characteristics : Patients who had decision-making capacity

Characteristics	**Having decision-making capacity to complete LW**			
	Total 177 (100)	**LW not introduced 94 (53.1)**	**LW introduced 83 (46.9)**	**P-value**
Sex, n (%)				
Male	84 (47.5)	47 (50.0)	37 (44.6)	0.569
Female	93 (52.5)	47 (50.0)	46 (55.4)	
Age Median (IQR)	64 (56 – 70)	63.5 (55 -72)	64 (57 - 68)	0.960
Age, n (%)				
< 65	96 (54.2)	53 (56.4)	43 (51.8)	0.647
≥ 65	81 (45.8)	41 (43.6)	40 (48.2)	
Insurance, n (%)				
Civil servant	70 (39.5)	35 (37.2)	35 (42.2)	0.886
UHC	88 (49.7)	48 (51.1)	40 (48.2)	
Social security	15 (8.5)	9 (9.6)	6 (7.2)	
Other	4 (2.3)	2 (2.1)	2 (2.4)	
Cancer as primary diagnosis, n (%)				
Cancer	162 (91.5)	83 (88.3)	79 (95.2)	0.171
Non-cancer	15 (8.5)	11 (11.7)	4 (4.8)	
Had at least one co-morbidity disease, n (%)				
Yes	98 (55.4)	55 (58.5)	43 (51.8)	0.457
No	79 (44.6)	39 (41.5)	40 (48.2)	
Had ACP discussed, n (%)				
Yes	92 (52.0)	56 (59.6)	36 (43.4)	0.045
No	85 (48.0)	38 (40.4)	47 (56.6)	

Characteristics	**Having decision-making capacity to complete LW**			
	Total 177 (100)	**LW not introduced 94 (53.1)**	**LW introduced 83 (46.9)**	**P-value**
PPS, n (%)				
10-30	68 (38.4)	48 (51.0)	20 (24.1)	< 0.001
40-60	95 (53.7)	45 (47.9)	50 (60.2)	
70-100	14 (7.9)	1 (1.1)	13 (15.7)	
Pain, n (%)				
None	65 (36.7)	39 (41.5)	26 (31.3)	0.231
Mild	23 (13.0)	10 (10.6)	13 (15.7)	
Moderate	50 (28.3)	22 (23.4)	28 (33.7)	
Severe	39 (22.0)	23 (24.5)	16 (19.3)	
Dyspnea, n (%)				
None	82 (46.3)	39 (41.5)	43 (51.8)	0.533
Mild	29 (16.4)	16 (17.0)	13 (15.7)	
Moderate	37 (20.9)	21 (22.3)	16 (19.3)	
Severe	29 (16.4)	18 (19.2)	11 (13.2)	

Table 2. Participant characteristics : Patients who were introduced for LW

Characteristics	**Introduced LW**			
	Total 83 (100)	**LW not completed 57 (68.7)**	**LW completed 26 (31.3)**	**P-value**
Sex, n (%)				
Male	37 (44.6)	26 (45.6)	11 (42.3)	0.966
Female	46 (55.4)	31 (54.4)	15 (57.7)	
Age Median (IQR)	64 (57-68)	66 (57 - 70)	63.5 (57 - 67)	0.520
Age, n (%)				
<65	43 (51.8)	28 (49.1)	15 (57.7)	0.626
>=65	40 (48.2)	29 (50.9)	11 (42.3)	
Insurance, n (%)				
Civil servant	35 (42.2)	23 (40.3)	12 (46.2)	0.535
UHC	40 (48.2)	30 (52.6)	10 (38.5)	
Social security	6 (7.2)	3 (5.3)	3 (11.5)	
Other	2 (2.4)	1 (1.8)	1 (3.8)	
Cancer as primary diagnosis, n (%)				
Cancer	79 (95.2)	53 (93.0)	26 (100)	0.304
Non-cancer	4 (4.8)	4 (7.0)	0 (0.0)	
Had at least one co-morbidity disease, n (%)				
Yes	43 (51.8)	29 (50.9)	14 (53.8)	0.989
No	40 (48.2)	28 (49.1)	12 (46.2)	
Had ACP discussed, n (%)				
Yes	36 (43.4)	25 (43.9)	11 (42.3)	1.000
No	47 (56.6)	32 (56.1)	15 (57.7)	

Characteristics	**Introduced LW**			
	Total 83 (100)	**LW not completed 57 (68.7)**	**LW completed 26 (31.3)**	**P-value**
PPS, n (%)				
10-30	20 (24.1)	15 (26.3)	5 (19.2)	0.763
40-60	50 (60.2)	33 (57.9)	17 (65.4)	
70-100	13 (15.7)	9 (15.8)	4 (15.4)	
Pain, n (%)				
None	26 (31.3)	21 (36.9)	5 (19.2)	0.407
Mild	13 (15.7)	8 (14.0)	5 (19.2)	
Moderate	28 (33.7)	17 (29.8)	11 (42.4)	
Severe	16 (19.3)	11 (19.3)	5 (19.2)	
Dyspnea, n (%)				
None	43 (51.8)	30 (52.7)	13 (50.0)	0.470
Mild	13 (15.7)	8 (14.0)	5 (19.2)	
Moderate	16 (19.3)	13 (22.8)	3 (11.6)	
Severe	11 (13.2)	6 (10.5)	5 (19.2)	