Quality of Dying in Hospital General Wards: A Cross-Sectional Study About the End of Life Care

Filippo Binda (✉ filippo.binda@policlinico.mi.it)
Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico

Marco Clari
University of Torino

Gabriella Nicolò
Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico

Simone Gambazza
Fondazione IRCCS Ca’ Granda Ospedale Maggiore Policlinico

Barbara Sappa
Fondazione IRCCS Ca’ Granda Ospedale Maggiore Policlinico

Paola Bosco
Fondazione IRCCS Ca’ Granda Ospedale Maggiore Policlinico

Dario Laquintana
Fondazione IRCCS Ca’ Granda Ospedale Maggiore Policlinico

Research Article

Keywords: end-of-life, hospital death, symptom control, quality of death, palliative care.

DOI: https://doi.org/10.21203/rs.3.rs-344953/v1

License: ☺️ ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License. Read Full License
Abstract

BACKGROUND

In the last decade, access to national palliative care programs have improved, however a large proportion of patients continued to die in hospital, particularly within internal medicine wards.

OBJECTIVES

To describe how adult patients die in the medical and surgical wards of a large tertiary-level university teaching hospital in the north of Italy, comparing the care and treatments between patients whose death was rated as highly, moderately or not expected by nurses.

METHODS

Single-centre cross-sectional study. Data on nursing interventions and diagnostic procedure in proximity of death were collected after interviewing the nurse and the physician responsible for the patient. Relationship between qualitative variables involving nursing procedures was summarized by means of multiple correspondence analysis (MCA).

RESULTS

Death was highly expected by nurses in 108 out of 187 patients included, whose primary diagnosis was respiratory (33.7%). Symptoms control was inadequate for the most severely ill patients: the most prevalent were asthenia (88.3%), mild or severe pain (69.0%), urinary incontinence (66.3%) and respiratory fatigue (64.8%). Physicians rated more frequently than nurses the quality of dying as good or very good, respectively 78.6% and 57.8%. The best quality of dying seems associated to the number of nursing interventions (mostly related to ensure comfort and to prevent pressure ulcers), female sex and low Norton scoring, as suggested by MCA.

CONCLUSION

Staff in medical and surgical wards still deal inadequately with the needs of dying people. Presence of hospital-based specialist palliative care could lead to improvements in the patients’ quality of life.

Introduction

In the last decade, there has been a profound epidemiological and clinical change in patients admitted to the medical wards of acute care hospitals.[1, 2] The availability of new therapeutic approaches and the
latest technology advancements (i.e., new ventilatory strategies) have moved beyond the survival of general population, whose death likely occurs in acute settings, now with large differences in the quality of end-of-life (EOL) care.[3]

The lack of organizational flexibility of acute care wards may not meet the specificity and complexity of patients at the end of their life.[4] Due to administrative problems and chronic shortage of hospice-beds, these patients are often not timely transferred to these facilities, thus continuing to receive therapeutic and diagnostic procedures that have not shown survival benefit.[5] In this context, it is clear that clinical decisions regarding EOL are becoming increasingly challenging, leaving space for the typical themes of palliative medicine.[6, 7] For instance, one-fourth of the deaths in Italy occur under the decisional process of one physician, who might either shorten or prolong patients’ life.[8]

According to a recent study, 45.7% of terminally ill patients, suffering from both oncologic and chronic-degenerative diseases, die in hospital, 44.4% at home, 6.1% in hospice and 3.8% in other settings (residential health facilities, ambulance).[9] The number of specialized facilities to assist dying patients in Italy has been increasing in the last 10 years, thanks to an explicit legislative act,[10] and programs for hospice-type terminal care at home as an alternative to hospitals are growing as well. However, as long as the hospital continues to be the place where a large proportion of people with terminal illnesses die (especially for patients with neoplastic diseases), a call to keep on improving the EOL care in general medicine wards is required, being no reason why the quality of care for dying people should be of lower quality in hospital than elsewhere.[11]

Improving the quality of dying is crucial not only for patients but also for all the professionals involved, as well as for caregivers and family members. However, the palliative care approach is lacking in many Italian hospitals,[12] and therefore it remains necessary to investigating EOL management and care. Describing treatments and patients’ symptoms in proximity of death would help to identify the main pitfalls and areas for improvement.

The main objective of the study is to describe how adult patients die in the medical and surgical wards of a large tertiary-level university teaching hospital in the north of Italy, comparing the care and treatments provided in patients whose death was rated as highly, moderately or not expected.

**Methods**

**Study design**

This single-centre cross-sectional study was carried out in 26 different medical and surgical wards of Fondazione IRCCS Ca’ Granda Ospedale Maggiore Policlinico (Milano, Italy), the largest public research hospital in Italy with 900 beds and more than 36,000 hospitalizations in 2019.

The study enrolled all adult patients (age ≥ 18 years), who died after at least 48 hours of hospital stay, between July and December 2019. Patients who died in the emergency room and intensive care units
were excluded from the enrolment because the type of care provided there is strictly aimed at keeping patients alive with different end-of-life management.

Data were collected by an independent nurse within 48 hours from patient's death, using a case report form created for the study, by interviewing the physician and nurse responsible for taking care of the patient at the time of death. Medical and nursing records were checked for data quality purposes. Deaths were classified as *highly*, *moderately*, or *not expected* on the basis of a question asked to the nurses and physicians in charge: “Had somebody told you yesterday that the patient would have died within a day, how far would you have agreed?”. Several other variables were collected, including the quality of dying rated by nurses and physicians on 5-point Likert scale from *very poor* to *very good*. Nurses were also asked to rate intensity of symptoms, classified as *severe*, *moderate* or *absent*, whenever these could be assessed. In the present study, Norton's scale was used as an assessment tool to predict the risk of suffering from pressure ulcers, as routinely implemented by nurses within the hospital.[13]

Compared to previous findings,[14] at least 159 individuals were needed to detect 10% change in the proportion of *good/very good* dying quality with 90% power using 5%-level two-sided test.

The local Ethics Committee approved the study protocol (no. 1099/2019). Data were collected and stored following the provisions of the Italian Data Protection Authority regarding personal data security and informed consent was obtained from all participants.

**Data analysis**

Metrics were reported as mean and standard deviation (sd) or counts and percentage together with 95% confidence intervals for mean or proportion. The association between categorical variables was assessed using Chi-square statistics, whereas the relationship between qualitative variables involving nursing procedures was evaluated by means of multiple correspondence analysis (MCA), which was useful to identify correlated variables and related to the quality of dying according to nurses’ own clinical judgment. Agreement between nurses and physicians was assessed by the means of Cohen's k coefficient. For all analyses, P-values were two-sided, and P < 0.05 was considered to be statistically significant. All the analyses were performed using R Core Team, version 3.6.2.

**Results**

Data were collected on 187 out of 224 patients deceased during the study period (37 patients were excluded because their death occurred < 48 hours after admission to the ward). The patients’ main characteristics are reported in Table 1. The mean(sd) age was 78.6(12.8) years with an average occurrence of death after 13.9(11.2) days from admission.
Table 1
– General characteristics of patients \((n = 187)\)

| Variable                                  | N (%)  |
|-------------------------------------------|--------|
| Age group, years                          |        |
| < 64                                      | 26 (13.9) |
| 64–74                                     | 35 (18.7) |
| 75–84                                     | 52 (27.8) |
| > 85                                      | 74 (39.6) |
| Males                                     | 105 (56.1) |
| Hospital admission                        |        |
| Emergency admission                       | 157 (83.9) |
| Planned admission                         | 30 (16.1) |
| Type of hospital ward                     |        |
| Medical ward                              | 169 (90.4) |
| Surgical ward                             | 18 (9.6) |
| Primary diagnosis                         |        |
| Respiratory                               | 63 (33.7) |
| Oncologic                                 | 42 (22.5) |
| Cardiovascular                            | 23 (12.3) |
| Infectious                                | 21 (11.2) |
| Neurologic                                | 18 (9.6) |
| Gastrointestinal                          | 11 (5.9) |
| Nephrologic                               | 8 (4.3) |
| Other diagnosis                           | 1 (0.5) |
| Time of death                             |        |
| Daytime hours (7 AM – 9 PM)               | 118 (63.1) |
| Nighttime hours (9 PM – 7 AM)             | 69 (36.9) |
| Cause of death                            |        |
| Cardiorespiratory arrest                  | 126 (67.4) |
| Sepsis / Multiple organ failure           | 44 (23.5) |
| Variable      | N (%) |
|---------------|-------|
| Liver failure | 10 (5.4) |
| Hemorrhage    | 7 (3.7) |

According to the nurses’ clinical judgment, death was *highly expected* in 54.4% (102/187) of patients, whereas it was *moderately expected* and *not expected* for the 33.6% (61/187) and 12.8% (24/187) of cases, respectively. Few procedures were found statistically associated with death expectation, as described in Table 2. In the last 48 hours, both routine (70.6%) and biomarkers (42.8%) blood tests were performed, at higher extent on patients whose death was *not expected*. Chest radiological examinations (19.8%) were statistically associated with nurses’ judgment, and these procedures were mostly prescribed to the group of patients whose death was *not expected* either (P = 0.007). At the time of death, in the 89.3% of the sample, resuscitation manoeuvres were not performed. Overall, emergency procedures showed statistically significant difference between death expectations as assessed by nurses (P < 0.001), and all the listed procedures had a low occurrence in the group whose death was *highly expected*. It is worth noting that the medical emergency team was activated to perform resuscitation manoeuvres on five patients only.
| Treatments and procedures          | Death not expected (n = 24) | Death moderately expected (n = 61) | Death highly expected (n = 102) | P-value |
|-----------------------------------|-----------------------------|-----------------------------------|--------------------------------|---------|
|                                   | n (%) 95% CI                | n (%) 95% CI                      | n (%) 95% CI                   |         |
| Routine blood tests               | 23 (95.8) 78.8–99.8         | 45 (73.8) 60.9–84.2               | 64 (62.7) 52.6–72.1            | 0.002   |
| Biomarkers blood tests            | 16 (66.7) 44.7–84.3         | 26 (42.6) 30.0–55.9               | 36 (35.3) 26.1–45.3            | 0.019   |
| Chest radiography                 | 10 (41.7) 22.1–63.4         | 13 (21.3) 11.8–33.6               | 14 (13.7) 7.6–21.9             | 0.007   |
| CT scan                           | 6 (25.0) 9.8–46.7           | 7 (11.5) 4.8–22.3                 | 14 (13.7) 7.6–21.9             | 0.267   |
| Intravenous fluid therapy (> 500 ml) | 17 (70.8) 48.9–87.4         | 48 (78.5) 66.1–87.9               | 78 (76.5) 67.1–84.3            | 0.744   |
| Blood transfusion                 | 6 (25.0) 9.8–46.7           | 12 (19.7) 10.6–31.9               | 10 (9.8) 4.8–17.3              | 0.078   |
| Hemodialysis                      | 3 (12.5) 2.6–32.4           | 2 (3.3) 0.4–11.4                  | 5 (4.9) 1.6–11.1               | 0.207   |
| Low flow oxygen therapy           | 20 (83.3) 62.6–95.2         | 56 (91.8) 81.9–97.3               | 89 (87.3) 79.2–93.1            | 0.450   |
| Non-invasive ventilation          | 4 (16.7) 4.7–37.4           | 12 (19.7) 10.6–31.9               | 13 (12.7) 6.9–20.7             | 0.490   |
| Artificial nutrition              | 5 (20.8) 4.6–37.1           | 17 (27.9) 16.6–39.1               | 41 (39.0) 30.7–49.7            | 0.098   |
| Urinary catheter                  | 14 (58.3) 36.6–77.8         | 40 (65.6) 52.3–77.3               | 69 (67.6) 57.6–76.5            | 0.687   |
| Enema for bowel evacuation        | 6 (25.0) 9.8–46.7           | 9 (14.8) 7.0–26.2                 | 6 (5.9) 2.2–12.4               | 0.016   |
| Emergency procedures              |                            |                                  |                                |         |
| Cardiopulmonary resuscitation     | 4 (16.7) 4.7–37.4           | 3 (4.9) 1.0–13.7                  | 2 (1.9) 0.2–6.8                | 0.010   |
| Pulmonary ventilation             | 5 (20.8) 7.1–42.1           | 6 (9.8) 3.7–20.1                  | 4 (3.9) 1.1–9.7                | 0.019   |

Abbreviations: 95% CI, 95% confidence interval; CT scan, computed tomography scan
The clinical judgment of nurses was used to assess the severity of the symptoms, as shown in Table 3. The level of consciousness, encoded with Ramsay Sedation Scale,[15, 16] was severely compromised (from sluggish response to a light glabellar tap or loud auditory stimulus to unresponsive to external stimuli, including pain) in 49.0% (50/102) of patients whose death was *highly expected*. By the contrary, 79.2% (19/24) of those whose death was *not expected* were awake (i.e., oriented and quiet or anxious and restless). Analgesic drugs (i.e., opioids and nonsteroidal anti-inflammatory drugs) were administered in the 76.7% (99/129) of patients with pain. Only 26.9% (36/134) of patients treated with analgesics drugs achieved good pain control and all patients with primary oncologic diagnoses received opioids. The palliative care consultant was requested for only two patients (1.1%), and the intensivist (13.4%) and the infectivologist (9.1%) were the most requested consultants.

| Treatments and procedures          | Death not expected (n = 24) | Death moderately expected (n = 61) | Death highly expected (n = 102) | P-value |
|------------------------------------|-----------------------------|-----------------------------------|--------------------------------|---------|
|                                    | n (%)                       | 95% CI                            | n (%)                          | 95% CI  | n (%)                          | 95% CI  |         |
| Vasopressors drugs                 | 7 (29.2)                    | 12.6–51.1                         | 3 (4.9)                        | 1.0–13.7| 1 (0.9)                        | 0.02–5.2| < 0.01  |
| No emergency procedures            | 16 (66.7)                   | 44.7–84.3                         | 54 (88.5)                      | 77.7–95.2| 97 (95.1)                      | 88.9–98.4| < 0.01  |

Abbreviations: 95% CI, 95% confidence interval; CT scan, computed tomography scan
Table 3
– Severity of signs and symptoms

| Signs and symptoms                  | Total n (%) | IC 95% | Patients with mild symptoms n (%) | IC 95% | Patients with severe symptoms n (%) | IC 95% |
|------------------------------------|-------------|--------|-----------------------------------|--------|-------------------------------------|--------|
| Asthenia*                          | 106 (88.3)  | 81.2–93.4 | 21 (17.5) | 11.2–25.5 | 85 (70.8) | 61.8–78.7 |
| Pain                               | 129 (69.0)  | 61.8–75.5 | 82 (43.9) | 36.6–51.3 | 47 (25.1) | 19.1–31.9 |
| Urinary incontinence               | 124 (66.3)  | 59.0–73.0 | 28 (15.0) | 10.2–20.9 | 96 (51.3) | 43.9–58.7 |
| Respiratory fatigue                | 121 (64.8)  | 57.5–71.6 | 62 (33.2) | 26.5–40.4 | 59 (31.6) | 25.0–38.8 |
| Confusion*                         | 77 (64.1)   | 54.8–72.6 | 49 (40.8) | 31.9–50.2 | 28 (23.3) | 16.1–31.9 |
| Agitation*                         | 77 (64.1)   | 54.8–72.6 | 45 (37.5) | 28.8–46.8 | 32 (26.6) | 18.9–35.4 |
| Gasping respiration                | 112 (59.9)  | 52.5–66.9 | 67 (35.8) | 28.9–43.1 | 45 (24.1) | 56.9–71.1 |
| Fecal incontinence                 | 96 (51.3)   | 43.9–58.7 | 41 (21.9) | 16.2–28.5 | 55 (29.4) | 22.9–36.5 |
| Bronchial secretions               | 94 (50.2)   | 42.8–57.6 | 53 (28.3) | 21.9–35.3 | 41 (21.9) | 16.2–28.5 |
| Pressure ulcers                    | 92 (49.2)   | 41.8–56.6 | 53 (28.3) | 21.9–35.3 | 39 (20.9) | 15.3–27.4 |
| Cough                              | 52 (27.8)   | 21.5–34.8 | 43 (23.0) | 17.2–29.7 | 9 (4.8)   | 5.3–14.0  |
| Fever                              | 51 (27.3)   | 21.0–34.3 | 20 (10.7) | 6.7–16.0  | 31 (16.6) | 11.6–22.7 |
| Nausea / vomiting                  | 34 (18.2)   | 12.9–24.5 | 14 (7.5)  | 4.2–12.3  | 20 (10.7) | 6.7–16.0  |

*Percentages calculated excluding 67 patients with severe impaired consciousness

Abbreviations: 95% CI, 95% confidence interval

Nursing care was provided until the moment of death. Hygiene of the body (partial or total) and oral care, together with the change of bedding, were the most frequent interventions provided by nurses. The relationship among these activities and nurses’ clinical judgment about death expectation is summarized in Fig. 1. The MCA biplot shows a global pattern along the first axis (Dim1) for patients whose death was qualitatively assessed as good or very good, mostly stretched on the left side of the plot. It can be
observed that death is not expected in young patients with high scores at Norton’s scale. In the opposite way, the MCA shows that being female is associated with old age (i.e., > 83 years old), with several nursing care interventions and also with a low Norton scoring. These characteristics belong mostly to patients whose quality of dying was perceived as good and very good (red dots) and whose death was moderately and highly expected.

Table 4 reports the clinical judgment of nurses and physicians about EOL quality. The Cohen’s kappa statistics showed fair agreement between the two professionals (k = 0.24, 95%CI 0.14 to 0.34, P < 0.001). In particular, physicians rated more frequently than nurses the quality of dying as good/very good, respectively 78.6% and 57.8%. Agreement between these two professionals was slightly better as far as death expectation is concerned (k = 0.32, 95%CI 0.20 to 0.44, P < 0.001): 54.5% and 66.3% rated death as highly expected, respectively.

| End of life quality | Nurse | 95% CI | Physician | 95% CI |
|--------------------|-------|--------|-----------|--------|
| Very good          | 14 (7.5) | 4.2–12.3 | 35 (18.7) | 13.4–25.0 |
| Good               | 94 (50.3) | 42.9–57.6 | 112 (59.9) | 52.5–66.9 |
| Average            | 47 (25.1) | 19.1–31.9 | 30 (16.0) | 11.0–22.0 |
| Poor               | 23 (12.3) | 7.9–17.8 | 7 (3.7) | 1.4–7.5 |
| Very poor          | 9 (4.8) | 2.2–8.9 | 3 (1.6) | 0.3–4.6 |

The analysis of the dying scenario found that 20.9% (39/187) of patients died in a single room and the majority (79.1%, 148/187) in multiple rooms (two to three beds). However, intimacy was always guaranteed for those who died in multiple rooms. Family members or caregivers had no restrictions in the 48 hours before death and they were physically present at the patient’s bedside in 69.6% (71/102) of cases whose death was highly expected. The communication with patient’s relatives or caregivers regarding the extreme severity of clinical conditions was carried out in 81.8% (153/187) of cases. Willingness to donate was recorded in 9.8% of patients (15/153), resulting in the corneal tissue removal procedure only.

**Discussion**

This study analysed treatments, symptoms and clinical management of adult inpatients at the end of their life. Notably, the majority of patients died in internal medicine wards where patients presenting with exacerbations of their chronic diseases are frequently hospitalized.[17]
Considering the differences in death expectation found in the present study, many patients underwent several diagnostic and therapeutic procedures in the last hours of life. Routine blood tests were the major diagnostic procedure performed in patients whose death was *highly expected*. Many patients underwent a considerable volume of blood samples for laboratory tests during the last hours,[18] phenomenon already described in previous studies, where at least 50% of patients whose death was highly expected performed blood tests before dying.[14, 19] Literature widely describes that also radiological procedures for diagnostic purposes are frequently performed in patients with poor prognosis admitted to hospice,[20] even if in the present study the diagnostic procedures (especially chest radiography) have been performed mainly in patients whose death was *not expected*.

The intensivist was the most requested consultant and the main responsibility was to declare the do-not-resuscitate order. This could explain the very small number of activations of the medical emergency team to perform cardiopulmonary resuscitation. Thus, the main activity of the intensivist was contributing to the decisions making over the appropriate intensity of care, both for patients suffering from end-stage chronic-degenerated and neoplastic diseases, as well as for patients with acute clinical conditions and poor prognosis.[21, 22] However, not all intensivists can make decisions about the appropriateness of treatments (i.e., administration of new antibiotics) or about the suitability of escalation to high dependency or intensive care. This is also acknowledged by the Italian Society of Anaesthesia, Analgesia, Resuscitation and Intensive care (SIAARTI), which has published specific recommendations to guide EOL decision-making for patients outside the intensive care unit.[23]

Performing diagnostic and therapeutic procedures clashes with the problem of symptoms control in the last hours of patients’ life. Symptoms like pain, agitation and dyspnea were only partially controlled in the present sample. In a large proportion of patients, the level of consciousness was severely compromised, thus they were not able to communicate appropriately the characteristics of pain. For this reason, it is recommended using clinical scoring tools for pain evaluation which may include patients’ behavior and not only professionals’ clinical judgment.[24] Nevertheless, reducing peri-mortem to a complex and demanding measuring act may be an obstacle for the final decision to care and not to cure.

Amidst symptoms, an effective pain control management is expected in most patients, and physicians should be comfortable in prescribing repeatable dose of analgesic drugs to reach the analgesic peak effect.[25] In this study, all patients with cancer received opioids. As documented in the last national report,[26] their usage seems to be constantly increasing. However, despite the administration of analgesic drugs, pain control was not always achieved and different studies show that an important percentage of patients without cancer (25–40%) does not receive an adequate pain-relieving treatment.[27] In addition to pain, the presence of respiratory symptoms (i.e., dyspnea), which mainly characterized the present cohort, may be of interest of the consultant in palliative medicine,[28] whose competencies were requested in a small number of patients, just because the hospital does not have a palliative care service.
As regards nursing care, patients continued to receive body hygiene care, active mobilization and vascular access management until the moment of death. Patients with a lower Norton score were at high risk of developing pressure ulcers, and this might explain the great number of nursing interventions received, mostly related to skin care and prevention of pressure ulcers onset, such as anti-bedsore mattress positioning.\[29\] Body and oral hygiene care are very important nursing interventions to provide comfort to the bedridden patients.\[30\] In particular, poor oral hygiene is the most common cause of mouth problem,\[31\] especially in weakened and fatigued patients. Nurses perceived a good EOL quality when they carried out a high number of interventions to old and frail patients, as summarised by MCA. Despite different cultural aspects could contribute to the concept of good death,\[32\] dying without discomfort and suffering is considered a good way of dying in any culture.\[32\] In order to improve the quality of EOL phase, treatments and nursing interventions are not always enough to relieve symptoms but it is also necessary to timely involving the family to support patients emotionally.\[33\] On the whole, the present findings show how interventions to ensure comfort and intimacy for patients whose death was highly expected were frequently carried out. Correct information regarding the severity of clinical conditions and the presence of family members, without any time constraints, were ensured to almost the totality of patients. These aspects were also included in the Liverpool Care Pathway model, a protocol that has been adopted in the United Kingdom for a decade, which help physicians and nurses to increase the quality of treatments in the EOL care.\[34\]

Despite the correct information about the clinical conditions, it is rare to address the theme of organs and fabrics for transplantation as a subject in the EOL care discussions.\[35\] Cornea transplant is the most common form of organ transplantation performed globally.\[36\] Unfortunately, it records a high refusal rate during organ donation request, as reported in the present study as well. As a result, the number of patients who need transplant exceed the cornea tissues availability.\[37\] Nurses are the caregivers most involved in EOL care and they could positively affect the organ donation request.\[38\] However, without an appropriate EOL care with patients’ families, donation, and the opportunity to help a large number of recipients, will not occur.\[39\]

The clinical judgment of nurses and physicians showed a moderate agreement about death expectation. This is not surprising, considering that identification of the EOL phase is incredibly difficult for the healthcare staff. Defining when a patient is in a phase of stability or instability, worsening or in a terminal phase (phase illness) can be very challenging,\[40\] particularly in patients without cancer.\[41\] However, prognostic information remains necessary not only for patients and their families, but also for healthcare providers, in order to guide their action and offer necessary interventions. Unfortunately, survival predictions made by clinicians suffer from their subjectivity and sometimes are overly optimistic and not always reliable.\[42, 43\] On the contrary, nurses could be the first to recognize patients’ end of life, potentially making a significant contribution to the EOL quality.\[44\] In fact, nurses and physicians showed also different rates of agreement about the quality of EOL in the present study. Nurses gave a lower rating compared to physicians, suggesting that they may equally expect death but perceived a different quality.
These divergencies can have various origins. First, training on EOL issues is very inhomogeneous and the most part of healthcare providers feel uncomfortable in facilitating EOL discussions. Also, nurses often have conflicting feelings when providing care to dying patients and experience distress when disagreeing with the appropriateness of the medical treatments. On the whole, the different professional background and professional aims may be responsible for such differences.

**Study limits**

The study has several limitations. The sampling was limited to our Institution and generalization should be made with cautious to smaller Italian hospitals. The expectation of death was asked only after the patient had died, and the subjectivity of the answers provided by nurses and physicians during the interviews could have overestimated the quality of EOL management. This is an unavoidable limitation for assessment of the dying experience. However, the limited time-window used to assess quality of dying in the present study should have minimized recall bias. Furthermore, we used only nurses’ judgment to stratify our analyses, being available other studies already showing lower accuracy to predicting death by physicians compared to nurses.

**Conclusion**

The presence of hospital-based specialist palliative care could lead to improvements in the patients’ quality of life, however the reduced number of palliative care consultations and the poor symptoms control suggest that the bottom line issues with EOL are not only related to hospital organization but also to intrinsic factor of each healthcare profession.

**List Of Abbreviations**

EOL  
End of Life  
MCA  
Multiple Correspondence Analysis  
SIAARTI  
Società Italiana Anestesia, Analgesia, Rianimazione e Terapia Intensiva

**Declarations**

*Ethics approval*

The Ethics Committee of Milano area 2 approved the study protocol (no. 1099/2019).

All participants (nurses and physicians) signed declaration of informed consent.

All methods were performed in accordance with the relevant guidelines and regulations.
Consent for publication

Not applicable.

Availability of data and materials

The datasets generated during and/or analyzed during the current study are not publicly available but are available from the corresponding author on reasonable request.

Competing interest

The authors declare that they have no competing interests.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Authors’ contributions

FB: Conceptualization, Investigation, Methodology, Data Curation, Writing – Original Draft
MC: Conceptualization, Supervision, Writing – Review & Editing
GN: Investigation, Data Curation, Writing – Original Draft
SG: Methodology, Formal Analysis, Writing – Review & Editing.
BS: Investigation, Data Curation
PB: Investigation, Data Curation
DL: Resources, Writing – Review & Editing, Supervision.

All authors read and approved the final manuscript.

Acknowledgments

The authors are grateful to all the nurses and physicians of Fondazione IRCCS Ca’ Granda Ospedale Maggiore Policlinico, Milan (Italy) for their commitment and willingness to help with this project. We would like to express our special appreciation to Professor Paola Di Giulio for critically revise the manuscript.

Authors’ information

1) Department of Healthcare Professions
References

1. Prince MJ, Wu F, Guo Y, Gutierrez Robledo LM, O’Donnell M, Sullivan R, et al. The burden of disease in older people and implications for health policy and practice. Lancet. 2015;385:549–62.

2. Hoogendijk EO, Afilalo J, Ensrud KE, Kowal P, Onder G, Fried LP. Frailty: implications for clinical practice and public health. Lancet. 2019;394:1365–75.

3. Broad JB, Gott M, Kim H, Boyd M, Chen H, Connolly MJ. Where do people die? An international comparison of the percentage of deaths occurring in hospital and residential aged care settings in 45 populations, using published and available statistics. Int J Public Health. 2013;58:257–67.

4. Schwarz B, Benson JJ. The “Medicalized Death”: dying in the hospital. J Hous Elderly. 2018;32:379–430.

5. Lusiani L, Bordin G, Mantineo G, Roncato P, Favaro L, Tessaro L, et al. Cure di fine vita nei pazienti oncologici terminali in Medicina Interna. Ital J Med. 2012;6:110–5.

6. Rossi PG, Beccaro M, Miccinesi G, Borgia P, Costantini M, Chini F, et al. Dying of cancer in Italy: Impact on family and caregiver. The Italian survey of dying of cancer. J Epidemiol Community Health. 2007;61:547–54.

7. Finn L, Malhotra S. The Development of pathways in palliative medicine: definition, models, cost and quality impact. Healthcare. 2019;7:22.

8. Miccinesi G, Puliti D, Paci E. End-of-life care and end-of-life medical decisions: the ITAELD study. Epidemiol Prev. 35:178–87.

9. Pivodic L, Pardon K, Morin L, Addington-Hall J, Miccinesi G, Cardenas-Turanzas M, et al. Place of death in the population dying from diseases indicative of palliative care need: A cross-national population-level study in 14 countries. J Epidemiol Community Health. 2016;70:17–24.

10. Casale G, Calvieri A. Palliative care in Italy: a historical perspective. Medic- Metodol Didatt e Innov Clin. 2014;22:21–6.

11. Dougherty M, Harris PS, Teno J, Corcoran AM, Douglas C, Nelson J, et al. Hospice care in assisted living facilities versus at home: results of a multisite cohort study. J Am Geriatr Soc. 2015;63:1153–7.

12. Beccaro M, Caraceni A, Costantini M. End-of-Life care in Italian hospitals: quality of and satisfaction with care from the caregivers’ point of view - results from the Italian survey of the dying of cancer. J Pain Symptom Manage. 2010;39:1003–15.
13. Norton D. Calculating the risk: reflections on the Norton Scale. Decubitus. 1989;2:24–31.

14. Toscani F, Di Giulio P, Brunelli C, Miccinesi G, Laquintana D. How people die in hospital general wards: A descriptive study. J Pain Symptom Manage. 2005;30:33–40.

15. Ramsay MAE, Savege TM, Simpson BRJ, Goodwin R. Controlled Sedation with Alphaxalone-Alphadolone. BMJ. 1974;2:656–9.

16. Carrasco G. Instruments for monitoring intensive care unit sedation. Crit Care. 2000;4:217–25.

17. Nardi R, Berti F, Greco A, Scanelli G, Leandri P, Reta M, et al. Complexity in hospital internal medicine departments: what are we talking about? Ital J Med. 2013;:142–55.

18. Bulger J, Nickel W, Messler J, Goldstein J, O'Callaghan J, Auron M, et al. Choosing wisely in adult hospital medicine: five opportunities for improved healthcare value. J Hosp Med. 2013;8:486–92.

19. Cardona-Morrell M, Kim JCH, Turner RM, Anstey M, Mitchell IA, Hillman K. Non-beneficial treatments in hospital at the end of life: A systematic review on extent of the problem. Int J Qual Heal Care. 2016;28:456–69.

20. Belloni E, Tentoni S, Cella A, Cassinelli D, Bertè R, Scagnelli P. Radiological exams on end-stage oncologic patients before hospice admission. Radiol Medica. 2017;122:793–7.

21. Hilton AK, Jones D, Bellomo R. The role of the intensivist and the rapid response team in nosocomial end-of-life care. Crit Care. 2013;17:224.

22. Bennett S, Grawe E, Jones C, Josephs SA, Mechlin M, Hurford WE. Role of the anesthesiologist-intensivist outside the ICU. Curr Opin Anaesthesiol. 2018;31:165–71.

23. SIAARTI - Italian Society of Anaesthesia Analgesia Resuscitation and Intensive Care Bioethic Board. End-of-life care and the intensivist: SIAARTI recommendations on the management of the dying patient. Minerva Anestesiol. 2006;72:927–63.

24. Herr K, Bjoro K, Decker S. Tools for assessment of pain in nonverbal older adults with dementia: A state-of-the-science review. J Pain Symptom Manage. 2006;31:170–92.

25. Groninger H, Vijayan J. Pharmacologic management of pain at the end of life. Am Fam Physician. 2014;90:26–32.

26. Italian Medicines Agency. National Report on Medicines use in Italy. Year 2019. Available from: https://www.aifa.gov.it/documents/20142/1205984/rapporto-osmed-2019.pdf/f41e53a4-710a-7f75-4257-404647d0fe1e. Accessed January 18, 2021.

27. Dalal S, Bruera E. Assessment and management of pain in the terminally ill. Prim Care Clin Off Pract. 2011;38:195–223.

28. Gomutbutra P, O’Riordan DL, Pantilat SZ. Management of moderate-to-severe dyspnea in hospitalized patients receiving palliative care. J Pain Symptom Manage. 2013;45:885–91.

29. Langemo D, Haesler E, Naylor W, Tippett A, Young T. Evidence-based guidelines for pressure ulcer management at the end of life. Int J Palliat Nurs. 2015;21:225–32.

30. Ribeiro P, Marques RMD, Ribeiro MP. Geriatric care: ways and means of providing comfort. Rev Bras Enferm. 2017;70:830–7.
31. Magnani C, Mastroianni C, Giannarelli D, Stefanelli MC, Di Cienzo V, Valerioti T, et al. Oral hygiene care in patients with advanced disease: an essential measure to improve oral cavity conditions and symptom management. Am J Hosp Palliat Med. 2019;36:815–9.

32. Meier EA, Gallegos J V., Montross-Thomas LP, Depp CA, Irwin SA, Jeste D V. Defining a good death (successful dying): literature review and a call for research and public dialogue. Am J Geriatr Psychiatry. 2016;24:261–71.

33. Soto-Rubio A, Perez-Marin M, Tomas Miguel J, Barreto Martin P. Emotional distress of patients at end-of-life and their caregivers: interrelation and predictors. Front Psychol. 2018;9:2199.

34. Jack BA, Gambles M, Murphy D, Ellershaw JE. Nurses’ perceptions of the Liverpool Care Pathway for the dying patient in the acute hospital setting. Int J Palliat Nurs. 2003;9:375–81.

35. Jawoniyi O, Gormley K, McGleenan E, Noble HR. Organ donation and transplantation: Awareness and roles of healthcare professionals—A systematic literature review. J Clin Nurs. 2018;27:e726–38.

36. Lawlor M, Kerridge I. Understanding selective refusal of eye donation: identity, beauty, and interpersonal relationships. J Bioeth Inq. 2014;11:57–64.

37. Williams AM, Muir KW. Awareness and attitudes toward corneal donation: challenges and opportunities. Clin Ophthalmol. 2018;12:1049–59.

38. Efstathiou N, Clifford C. The critical care nurse’s role in End-of-Life care: issues and challenges. Nurs Crit Care. 2011;16:116–23.

39. Bell L. Support for families deciding about organ donation. Am J Crit Care. 2010;19:462–462.

40. Masso M, Allingham SF, Banfield M, Johnson CE, Pidgeon T, Yates P, et al. Palliative care phase: inter-rater reliability and acceptability in a national study. Palliat Med. 2015;29:22–30.

41. Lastrucci V, D’Arienzo S, Collini F, Lorini C, Zuppiroli A, Forni S, et al. Diagnosis-related differences in the quality of end-of-life care: A comparison between cancer and non-cancer patients. PLoS One. 2018;13:e0204458.

42. White N, Kupeli N, Vickerstaff V, Stone P. How accurate is the “surprise question” at identifying patients at the end of life? A systematic review and meta-analysis. BMC Med. 2017;15:139.

43. Cheon S, Agarwal A, Popovic M, Milakovic M, Lam M, Fu W, et al. The accuracy of clinicians’ predictions of survival in advanced cancer: a review. Ann Palliat Med. 2016;5:22–9.

44. Blaževičienė A, Laurs L, Newland JA. Attitudes of registered nurses about the end-of-life care in multi-profile hospitals: A cross sectional survey. BMC Palliat Care. 2020;19:1–8.

45. Brighton LJ, Bristow K. Communication in palliative care: talking about the end of life, before the end of life. Postgrad Med J. 2016;92:466–70.

46. De Brasi EL, Giannetta N, Ercolani S, Gandini ELM, Moranda D, Villa G, et al. Nurses’ moral distress in end-of-life care: A qualitative study. Nurs Ethics. 2020.

47. Ay MA, Öz F. Nurses attitudes towards death, dying patients and euthanasia: A descriptive study. Nurs Ethics. 2019;26:1442–57.
48. Perez-Cruz PE, Dos Santos R, Silva TB, Crovador CS, Nascimento MS de A, Hall S, et al. Longitudinal temporal and probabilistic prediction of survival in a cohort of patients with advanced cancer. J Pain Symptom Manage. 2014;48:875–82.

49. White N, Reid F, Vickerstaff V, Harries P, Stone P. Specialist palliative medicine physicians and nurses accuracy at predicting imminent death (within 72 hours): a short report. BMJ Support Palliat Care. 2020;10:209–12.

Figures

Figure 1

Biplot containing individuals (dots) and variables categories in two dimensions. Multiple Correspondence Analysis (MCA) referred to nurses’ expectation about death (Not Expected, Moderately and Highly Expected) and nursing care interventions delivered or not to males (M) and females (F): anti-bedsore mattress (ABM; NO ABM), body hygiene care (BHC; NO BHC), oral hygiene care (OHC; NO OHC), artificial tears (AT; NO AT), tracheal suctioning (TS; NO TS), active mobilization (AM; NO AM) and vascular access
management (VAM; NO VAM). Blue filled dots denote individuals with very poor/poor/average quality of
death whereas red filled dots patients with good or very good quality of death. Variable categories with a
similar profile are grouped together, whereas negatively correlated variable categories are positioned on
opposite sides of the plot origin. The Dim1 axis is the first dimension along which the sample show the
largest variation, whereas Dim2 is the second most important dimension and it is orthogonal to the Dim1,
which explain the 8.9% of variation in the data.