

Original Article

End of Life Cost Savings in the Palliative Care Unit Compared to Other Services



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Abstract

Context. Hospital deaths carry a significant healthcare cost that has been confirmed to be lower when palliative care units (PCUs) are available.

Objectives. To compare the last admission hospital health care cost of dying in a first-level hospital between the PCU and the rest of the hospital services.

Methods. A retrospective, comparative, observational study evaluating costs from the payer perspective on treatments and diagnostic-therapeutic tests performed on patients who die in first-level hospital, comparing whether they were treated by the PCU or another unit (Non-PCU). Patients with a mortality risk >2 were included according to the Severity of Illness Index (SOI) and Risk of Mortality (MOR). All cost express in €, median per patient and interquartile range (IQR).

Results. From 1,833 patients who died, 1,389 were included, 442 (31.1%) treated by PCU and 928 (68.9%) Non-PCU. Statistical differences were found for the last admission total cost (€262.8 (€470.1) for PCU versus €515.3 (€980.48) in Non-PCU), daily total cost (€74.27 (€127.4) vs €115.8 (€142.4) Non-PCU). Savings were maintained when the sample was broken down by diagnosis-related group (DRG) and a multivariate analysis was performed to determine how the different patients baseline characteristics between PCU and Non-PCU patients influenced the results obtained.

Conclusions. Data from this study show that cost is significantly lower when the patients are treated by a PCU during their last hospital stay when they pass away. *J Pain Symptom Manage* 2022;64:495–503. © 2022 The Authors. Published by Elsevier Inc. on behalf of American Academy of Hospice and Palliative Medicine. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Key Words

Palliative care, cost, inpatient, unit, hospital, death

Introduction

It is well known that most of the healthcare expenditure in Western countries is generated at the end of life, within the last 6 months of life accounting for 40% of healthcare expenditure.¹⁻³ This situation, combined with an ageing population in this part of the world, has led to a rapid growth in healthcare expenditure in recent years.⁴

Certain studies demonstrate that palliative care (PC) teams decrease the cost of clinical attendance in

patients with advanced disease without reducing the quality.⁵⁻⁷ However, despite the demonstrated effectiveness of care by PC teams, the implementation of PC remains deficient in many countries.⁸ It is estimated that worldwide 56.8 million people need PC (25.7 million in the last of life), situation being observed unequally depending on country.⁹ Although sustained growth in palliative care is evident, it has slowed in the last decade and the situation is unequally depending on the country.^{8,10-14}

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In Spain, public expenditure on health grew by 4,193.5 million euros in 2019, this has been related to increased emergency care visits and the greater number of unplanned admissions in the last weeks of life.^{9,15} Although palliative coverage is only available in this country for 50% of the population, it can be stated that, as in other countries with similar healthcare systems, it has resulted in savings and proven lower cost thanks to the optimization of the aforementioned healthcare resources.¹⁵⁻¹⁹

Most of the PC teams cost studies measure the impact of the home PCU on the number of hospitalizations, length of hospital stays, number and length stays in the Intensive Care Unit (ICU), chemotherapy use, hospital emergency room visits and readmissions at 30 days post-discharge. Only a few analyse the hospitalization costs, but they focus on specific interventions, and do not compare hospital direct cost between PCU and the rest of the services.²⁰⁻²²

The aim of this study, is to analyse the of end-of-life patient care cost during their last admission, comparing whether patients are hospitalized in the Palliative Care Unit (PCU) or in another Hospital Unit (Non-PCU).

Methods

A retrospective, comparative, observational, resource consumption analysis, from the hospital perspective, was conducted on patients who died of advanced disease in Infanta Elena Hospital (IEH) during a three-year period (January 2016 to December 2018). IEH is a University District Hospital, located in Valdemoro, Community of Madrid, Spain, that has 135 admission beds and a palliative care unit (PCU) that assists between 8 and 14 admitted patients daily, staffed by a physician, a nurse, and a psychologist.

Cost analysis, from the hospital perspective, was performed to compare the results between those who were attended in a PCU versus those attended in other departments (Non-PCU). Other Hospital departments with admissions available are general and digestive surgery, internal medicine, cardiology, pneumology, haematology, urology, traumatology, neurology, digestive and geriatrics and gynaecology.

The choice of service where the patient must be hospitalized in IEH is decided by a multidisciplinary team composed of all the specialties with admission beds. PCU mainly receives oncologic patients and others that have already been treated by them.

To ensure the homogeneity of the groups compared, clinical records both PCU and Non-PCU were revised by the principal investigator. Only patients with palliative care needs and high mortality risk were included. NECPAL 4.0 prognostic and palliative care needs assessment tool for inclusion in the palliative care programs was employed to confirm patients

palliative care needs.²³ The Severity of Illness Index (SOI), and the Risk of Mortality (MOR) were used as mortality criterion. According to these indices, mortality risk is defined as the probability of dying from the diagnosis that led to the admission, assessed on a scale from 1 to 4, where 1 is the lowest risk, 2 moderate, 3 major, and 4 extremes.²⁴⁻²⁶ Patients with a severity and mortality (MOR & SOI) greater than 2 were included.

Children under 18 years of age, deaths from accidents or acute complications and patients admitted in agony (signs of imminent death) were excluded.

The main cost variables analysed per patient in the last hospital admission are and include:

- Pharmacological treatment cost: enteral nutrition and drugs administered (calculated for each prescribed drug and patient through the administered drug regimen and the unitary cost).
- Other intervention cost: surgeries, transfusions, laboratory and imaging tests performed.
- Last admission cost: pharmacological treatment and other interventions.
- Total daily cost: last admission cost divided into the hospital stay length.

Healthcare personnel and services infrastructures costs were not included because they are similar (data obtained did not provide differences between the salary of healthcare personnel) among the different hospital services and the results have been adjusted by day of admission.

IEH Management and Pharmacy department provided the pharmacological treatments during cost data. All unit costs of each resource consumed between 2016-2018 expressed in 2020 € and were updated with the consumer price index variation provided by the Spanish National Statistics Institute (INE).²⁷

The unitary costs per diagnostic test and transfusions are those referred in Ministry of Health 727/2017 Order of 7 August 2017, which establishes the provision public prices of healthcare services and activities for the centre network in the Community of Madrid public prices, also updated to 2020.²⁸

A descriptive and univariate statistical analysis was performed initially comparing the results obtained in the group of patients who died in the PCU versus those who died in other units (Non-PCU). To analyse possible differences in results by reason for admission, the database was segmented by the groupings done according to the Diagnosis-Related Group (DRG).²⁹

Categorical variables were expressed as relative and absolute frequencies, and quantitative variables were expressed as the median and interquartile range since most of them did not follow a normal distribution. Comparisons were subsequently made using the chi-squared test for dichotomous qualitative variables, and

Fisher's test was used in the event the two variables to be compared were dichotomous. Quantitative variables were compared using a student's t test or ANOVA for independent samples in case of normal distribution, and a Wilcoxon test and a Friedman test when variables did not follow a normal distribution.

Multivariate analysis (binary logistic regression), was carried out to determinate whether the possible differences between PCU and Non-PCU patients influenced the results obtained for the patient total daily cost (categorized as a dichotomous variable using the median obtained for the total study population as reference value).

All analyses were performed using the IBM SPSS Statistics v26 and RStudio statistical package.

Results

Of the 1,833 patients who died at IEH between January 2016 and December 2018, 1,591 had palliative needs (NECPAL+), 1,370 met the inclusion criteria, 442 from PCU and 928 Non-PCU. 221 patients excluded, 202 Non-PCU because their mortality risk

was ≤ 2 and 19 PCU because they were admitted with terminal sedation.

Univariate analysis to assess homogeneity of the groups of patients seen or not by the PCU showed no differences by severity index or mortality risk between the groups (Table 1). Differences by age, type of disease and length hospital stay were found.

Table 2 shows a lower consumption of resources when patients were attended by the PCU. The proportion of patients in whom surgery, diagnostic and laboratory tests are performed, parenteral or enteral nutrition is administered, as well as the number of drugs administered, is always lower and statistically significant when patients hospitalized in PCU.

The cost assessment results demonstrates that cost are significantly lower in the PCU patients compared to Non-PCU (Table 3). These median differences are €93.3 for the pharmacological treatment cost, €92.0 for other interventions cost, €252.5 for last admission total cost and 41.5€ for total daily cost.

The cost analysis breakdown by admission diagnosis group (Table 4) maintains the differences for the last

Table 1

Characteristics of the study population and their distribution according to whether they were treated or not in the Palliative Care Units (PCU) of Infanta Elena Hospital.

	Total	PCU	Non-PCU	p-value**
N	1370	442 (32.3%)	928 (67.7%)	
Age*: median IQR	85 (3)	83 (16)	86 (11)	p<0.001
Age*: N (%)				
< 75 years	288 (21.0%)	136 (30.8%)	152 (16.4%)	p<0.001
≥ 75 years	1082 (79.0%)	306 (69.2%)	776 (83.6%)	
Sex: N (%)				
Male	666 (48.6%)	230 (52.0%)	436 (47.0%)	p= 0.080
Female	705 (51.4%)	212 (48.0%)	593 (53.0%)	
Year of death: N (%)				
2016	430 (31.4%)	145 (32.8%)	285 (30.7%)	p=0.086
2017	473 (34.5%)	164 (37.1%)	308 (33.2%)	
2018	468 (34.1%)	133 (30.1%)	335 (36.1%)	
Severity Index: N (%)				
2	59 (4.3%)	14 (3.2%)	45 (4.8%)	p=0.307
3	684 (49.9%)	228 (51.6%)	456 (49.1%)	
4	628 (45.8%)	200 (45.2%)	427 (46.0%)	
Mortality risk: N (%)				
3	639 (46.6%)	212 (48.0%)	427 (46.0%)	p=0.499
4	732 (53.4%)	230 (52.0%)	501 (54.0%)	
Diagnosis (DRG)***: N (%)				
Oncological	177 (12.9%)	130 (29.4%)	47 (5.1%)	P <0.001
Sepsis	470 (34.3%)	166 (37.6%)	304 (32.7%)	p=0.078
Respiratory disease	357 (26.0%)	76 (17.2%)	281 (30.2%)	p=<0.001
Cardiovascular disease	153 (11.2%)	38 (8.6%)	115 (12.4%)	p=0.038
Other heart disease	67 (4.9%)	14 (3.2%)	53 (5.7%)	p=0.042
Liver or kidney failure	47 (3.4%)	7 (1.6%)	40 (4.3%)	p=0.010
Other GI disease	48 (3.5%)	5 (1.1%)	42 (4.5%)	p=0.001
Others	52 (3.8%)	6 (1.4%)	46 (5.0%)	p=0.001
Length of hospital stay (days): median IQR	5 (7)	4 (5)	6 (7)	p<0.001

DRG: Diagnosis Related Group that caused the hospital admission; GI: GastroIntestinal; IQR: Inter-Quartile Range.

*Patients age at the time of last hospital admission.

**p-value significance level <0.05.

***DRG levels that caused last hospitalization includes: Oncological (oncology or hematology neoplasms, lymphomas and neo-formations), Sepsis (infection or sepsis), Respiratory (pneumonia, bronchitis, chronic obstructive disease...), Cardiovascular disease (acute myocardial infarction, cardiovascular events, transient ischemic attack, convulsions, nervous system vascular diseases), Other heart disease (congestive heart failure and other heart failure), Kidney and liver failure (also hepatobiliary disorders), Other gastrointestinal diseases and Other diagnosis (mainly endocrine disorders, musculoskeletal diseases and trauma).

Table 2
Patients resource consumption in the last week of life depending on whether they were treated in palliative care units (PCU) or Non-PCU.

Total number of patients N (%)	PCU	Non-PCU 442 (32.3%)	p-value* 928 (67.7%)
Hospital length stay (days)	4 (5)	6 (7)	p<0.001
Median (IQR)			
Laboratory Tests done:	2 (3)	4 (4)	p<0.001
Median (IQR)			
CT Scan**	63 (14.3%)	241 (26.0%)	p<0.001
N (%)			
X-ray test**	305 (69.0%)	785 (82.9%)	p<0.001
N (%)			
Parenteral Nutrition	69 (15.6%)	195 (21.0%)	p=0.018
N (%)			
Surgeries**	4 (0.9%)	46 (5.0%)	p<0.001
N (%)			
Transfusions**	47 (5.0%)	14 (3.2%)	p=0.235
N (%)			
Total number of drugs prescribed in the last day of life:	18 (11)	20 (12)	P<0.001
Median (IQR)			
- Number of drugs as scheduled prescription:	14 (8)	17 (9)	P<0.001
- Number of "as needed" (PRN) drugs:	3 (2) max:11	3 (2) max:7	P=0.001

PCU: Palliative Care Unit; %: percentage; IQR: Inter-Quartile Range; CT-scan: Computerized Tomography Scan PRN: *pro re nata*.

*p-value significance level <0.05.

**Patients who had at least one.

admission total cost but not for the daily total cost. Table 5 shows the multivariate analysis results when we include DRG, department type, age group, and gender to determine which variables has a statistically significant influence on having a cost higher than the population median (€101,17) the cost per patient. Age lower than 75 years, Non-PCU and cardiovascular disease DRG shows higher risk of having a cost over the median per patient.

Discussion

Although there are some different baseline characteristics per DRG and age, our study results

indicate that patients who died between January 2016 and December 2018, hospitalized in the IEH PCU, had lower direct hospital costs during their last admission than patients with the same level of severity and mortality risk seen admitted in Non-PCU. This difference is clearly significant in both overall and daily costs, with a total daily cost in the PCU of €74.3 compared to €115.8 in Non-PCU. To date, quality end-of-life specialized care had been found to lower cost because of a decrease in the number of admissions, length of hospital stay, a reduction in the number of ICU stays and emergency hospital visits and the cost during last hospital admission.^{7,21,22,30,31}

Increasingly, patients in the last of life with multiple or complex diseases have palliative needs. This patient profile is usually admitted to units with high scientific and technical levels, but with a lack of training in palliative care,³² which may lead to a use of resources that provide no benefits and incur high costs for the health-care system.²² For this reason, as it has already been initiated, we consider that knowledge of palliative care should be integrated into the training programs of these specialties.³³⁻³⁶

Using all available means to prolong survival of patients under their care, not taking an initial approach that considers the obtainable risk-benefit, depending on the therapeutic effort of each intervention, could be the reason why patients not seen by the PCU have had a slightly longer survival, without achieving an objective benefit.³⁷ In contrast, the approach focused on the suitability of therapeutic effort by the PCU is based on a clinical approach that is, from the viewpoint of the authors of this research, more appropriate and whose clinical decision-making is based on avoiding using not proportional measures that prolong survival without improving quality of life when cure is not possible, fully applying the provisions of article 36.1 of the Code of Medical Ethics.³⁸

The savings achieved by PC teams during hospital admission are well known.^{7,21,31} However, they refer to the cancer population, and focus on reducing hospital stays, days in the ICU, or use of chemotherapy.^{39,40}

Table 3
Cost assessment of dying in the hospital comparing between PCU and Non-PCU departments.

Cost per patient (€)	Total		PCU		Non-PCU		PCU vs Non-PCU	
	Median	IQR	Median	IQR	Median	IQR	Median Difference	p-value**
Pharmacological treatment cost	€123.9	€370.5	€65.8	€157.3	€159.1	€452.9	-€93.3	p<0.001
Other interventions cost	€214.0	€347.5	€152.0	€226.0	€244.0	€383.8	-€92.0	p<0.001
Last admission total cost	€430.8	€799.6	€262.8	€470.1	€515.3	€980.9	-€252.5	p<0.001
Total daily cost	€101.17	€142.9	€74.3	€127.4	€115.8	€127.4	-€41.5	p<0.001
Patients (N)	1331		442		928			

PCU: Palliative Care Unit; €: euros; IQR: Inter-Quartile Range.

*p-value significance level <0.05.

Table 4

Expenditure breakdown by diagnosis that caused last hospitalization according to DRG* of cost assessment of dying in the hospital comparing between PCU and Non-PCU departments (expressed in € with median per patient and IQR).

Patients diagnosed with Oncological N=173	PCU N=26	Non-PCU N=47	p-value**
Pharmacological treatment cost	€75.3 (862.2)	€307.4 (862.2)	p<0.001
Other interventions cost	€183.0 (316.3)	€725.0 (1352.5)	p<0.001
Last admission total cost	€386.7 (980.9)	€1219.90 (1889.7)	p<0.001
Total daily cost	€80.2 (195.9)	€165.6 (201.4)	p=0.165
Length of hospitalization (days)	4.0 (6.0)	16.0 (17.0)	p<0.001
Total number of drugs prescribed in the last day of life:	18.5 (13.25)	21 (13)	p<0.001
- Number of scheduled prescription drugs	14 (8.25)	21 (12)	p<0.001
- Number of "as needed" (PRN) drugs	4 (2)	2 (3)	p=0.002
Patients diagnosed with Sepsis N=470	PCU N=163	Non-PCU N=294	p-value*
Pharmacological treatment cost	€60.3 (111.6)	€174.9 (450.5)	p<0.001
Other interventions cost	€124.0 (180.0)	€212.0 (326.0)	p<0.001
Last admission total cost	€207.9 (248.9)	€462.7 (758.3)	p<0.001
Total daily cost	€63.5 (93.5)	€110.1 (131.6)	p<0.001
Length of hospitalization (days)	4.0 (5.0)	5.0 (7.0)	p=0.032
Total number of drugs prescribed in the last day of life:	17 (10)	19 (11)	p=0.024
- Number of scheduled prescription drugs	14 (6)	17 (8.25)	p<0.001
- Number of "as needed" (PRN) drugs	3 (2)	3 (2)	P=0.569
Patients diagnosed with Respiratory Disease N=357	PCU N=76	Non-PCU N=281	p-value*
Pharmacological treatment cost	€32.4 (81.6)	€115.9 (391.0)	p=0.009
Other interventions cost	€203.8 (256.0)	€349.5 (672.3)	p=0.018
Last admission total cost	€279.0 (431.6)	€647.9 (1000.1)	p=0.007
Total daily cost	€91.7 (132.2)	€132.8 (151.7)	p=0.138
Length of hospitalization (days)	3.0 (4.0)	6.0 (8.0)	p=0.097
Total number of drugs prescribed in the last day of life:	16 (12.3)	19 (13)	p=0.296
- Number of scheduled prescription drugs	12 (8)	15 (11)	p=0.026
- Number of "as needed" (PRN) drugs	3 (2)	3 (3.5)	p=0.006
Patients diagnosed with Cardiovascular Disease N=153	PCU N=38	Non-PCU N=105	p-value*
Pharmacological treatment cost	€32.4 (81.6)	€115.9 (391.0)	p=0.022
Other interventions cost	€203.8 (256.0)	€349.5 (672.3)	p=0.001
Last admission total cost	€279.0 (431.6)	€647.9 (1018.2)	p=0.001
Total daily cost	€91.7 (132.2)	€132.8 (151.7)	p=0.056
Length of hospitalization (days)	3.0 (4.0)	6.0 (8.0)	p=0.233
Total number of drugs prescribed in the last day of life:	16 (12.3)	19 (13)	P=0.390
- Number of scheduled prescription drugs	12 (8)	15 (11)	p=0.027
- Number of "as needed" (PRN) drugs	2 (3)	3 (3.5)	P=0.008
Patients diagnosed with Other Heart Disease N=67	PCU N=14	Non-PCU N=53	p-value*
Pharmacological treatment cost	€89.6 (414.5)	€328.1 (719.9)	p=0.041
Other interventions cost	€168.0 (183.5)	€244.0 (276.0)	p=0.185
Last admission total cost	€317.3 (497.3)	€716.0 (940.7)	p=0.019
Total daily cost	€93.8 (119.9)	€109.3 (99.2)	p=0.388
Length of hospitalization (days)	5.0 (5.0)	6.0 (6.0)	p=0.085
Total number of drugs prescribed in the last day of life:	21.5 (6.8)	24 (12.5)	p=0.757
- Number of scheduled prescription drugs	19 (8.8)	20 (10)	p=0.256
- Number of "as needed" (PRN) drugs	3.5 (2.3)	3 (3)	p=0.594

Patients diagnosed with Liver or Kidney Failure N=51	PCU N=7	Non-PCU N=40	p-value*
Pharmacological treatment cost	€60.3 (56.2)	€277.2 (879.3)	p=0.009
Other interventions cost	€122.0 (257.5)	€380.5 (782.4)	p=0.005
Last admission total cost	€261.1 (301.1)	€818.9 (2295.9)	p=0.003
Total daily cost	€65.3 (230.2)	€129.2 (184.7)	p=0.150
Length of hospitalization (days)	4.0 (2)	7 (17)	p=0.104
Total number of drugs prescribed in the last day of life:	19 (9)	21 (10.5)	p=0.919
- Number of scheduled prescription drugs	9.0 (2)	18 (11.8)	p=0.004
- Number of "as needed" (PRN) drugs	3 (1)	3 (3.8)	p=0.826

Patients diagnosed with Other Gastrointestinal Disease N=48	PCU N=5	Non-PCU N=42	p-value*
Pharmacological treatment cost	€125.2 (415.1)	€96.2 (422.4)	p=0.880
Other interventions cost	€499.2 (849.8)	€413.3 (475.3)	p=0.880
Last admission total cost	€705.1 (968.3)	€556.8 (1073.3)	p=0.336
Total daily cost	€260.9 (315.2)	€138.5 (246.6)	p=0.256
Length of hospitalization (days)	4.0 (4.0)	4.5 (7)	p=0.651
Total number of drugs prescribed in the last day of life:	19 (7.5)	17 (11)	p=0.854
- Number of drugs as scheduled prescription	14 (6)	16.5 (9)	p=0.287
- Number of "as needed" (PRN) drugs	5 (1.5)	3 (2)	p=0.075

Patients with Other Diagnosis N=52	PCU N=6	Non-PCU N=46	p-value*
Pharmacological treatment cost	€24.9 (146.9)	€299.9 (523.9)	p=0.007
Other interventions cost	€92.0 (63.5)	€411.0 (802.4)	p=0.002
Last admission total cost	€131.4 (234.1)	€960.9 (1507.4)	p=0.001
Total daily cost	€84.9 (51.3)	€119.0 (169.1)	p=0.199
Length of hospitalization (days)	2.5 (4.0)	7.0 (8.0)	p=0.014
Total number of drugs prescribed in the last day of life:	13.5 (14.3)	24 (12.5)	p=0.055
- Number of drugs as scheduled prescription	10 (11.3)	21 (10)	P=0.033
- Number of "as needed" (PRN) drugs	2 (4)	5 (3)	p=0.068

PCU: Palliative Care Unit; €: euros; IQR: Inter-Quartile Range; PRN: pro re nata.
**p-value significance level <0.05.

This study included both oncological and non-oncological patients, focusing on the last hospital admission of patients dying in the hospital, showing that savings with PC teams were due to the more appropriate use of hospital resources. Similarly, certain studies show economic benefits with better cost efficiency in non-cancer patients seen by PC teams, but they have again focused on overall reduction of admission costs and not on a cost analysis according to the resources used, as performed in this study.^{41,42}

Early palliative care intervention gradually reduces costs in the care of cancer patients with advanced disease, but apparently, during the last stay as good palliative care needs more human resources than other specialties, costs could increase during the last hospital stay of this kind of patients.^{30,43} Our data suggest that palliative care during the last admission optimizes the resources used to care for these patients. It is necessary to check whether this optimization of resource use is associated with an increased perception of quality of life as seen in early care.

In contrast to other cost analyses, mention should be made of the homogeneity of the study group, patients at high risk of morbidity and mortality in whom death

was expected. This makes it possible to compare the use of hospital resources from a treatment proportionality perspective. Having performed an analysis based on the DRG shows us how resources have been used according to diagnosis and can guide us in future research on decision-making.

Results differ when we breakdown the analysis by diagnosis (DRG) that caused last hospitalization, last admission total cost stills have significant lower cost in patients attended by PCU compared to Non-PCU, but this difference does not prevail when we analyse the cost per day of admission, where it is only maintained for the 470 patients with an Infection or Sepsis DRG (34% of the sample).

The main limitation of this study is to be retrospective and that only one of the researchers revised the clinical records of the patients included, with no double check for the selection. Other limitation is that there may be screening bias in the selected sample because patients with lower expectations for survival had been referred to the PCU. To reduce this potential bias, only patients with a risk of severity and mortality (MOR & SOI) greater than 2 were included in this study, thus confirming that the two

Table 5

Univariate analysis and backward multivariate analysis between the independent variables (DRG, department type, age and gender) and cost higher or lower than the median population (€107.17).

	Univariate			Multivariate			
	N	≥€101,17n (%)	> €101,17n (%)	p-value*	OR	95% CI	p-value*
Diagnosis (DRG)				0.012			
Oncological	173	86 (49.7%)	87 (50.3%)		1,31	0.67,2.55	0.426
Sepsis	457	251 (54.9%)	206 (45.1%)		1,09	0.60,1.97	0.783
Respiratory disease	346	179 (51.7%)	167 (48.3%)		1,13	0.62,2.06	0.682
Cardiovascular disease	143	54 (37.8%)	89 (62.2%)		2,15	1.11,4.16	0.022
Other heart disease	67	32 (47.8%)	35 (52.2%)		1,43	0.68,3.01	0.340
Hepatic or renal failure	47	19 (40.4%)	28 (59.6%)		1,50	0.66,3.41	0.328
Other GI disease	47	18 (38.3%)	29 (61.7%)		1,72	0.76,3.89	0.194
Other diagnosis	51	27 (52.9%)	24 (47.1%)		—	—	
Department Type				<0.0001			
Non-PCU	898	406 (45.2%)	492 (54.8%)		2,07	1.59,2.68	0.000
PCU	433	260 (60.0%)	173 (40.0%)		—	—	
Age				<0.0001			
< 75 years	278	106 (38.1%)	172 (61.9%)		2,16	1.60,2.91	0.000
≥ 75 years	1,053	560 (53.2%)	493 (46.8%)		—	—	
Gender				0.826			
Male	643	324 (50.4%)	319 (49.6%)		0,99	0.79-1.23	0.904
Female	688	342 (49.7%)	346 (50.3%)		—	—	

OR: Odds Ratio; CI: Confidence Interval; GI: Gastrointestinal.

** p-value significance level <0.05.

study groups had the same risk of mortality, which led to the exclusion of 202 patients from the group of deceased patients not seen by the PCU. This study is also limited because this research was conducted in a single hospital, and although the sample is large, a study could be completed using the same method in all other hospitals in the Autonomous Community to reinforce this hypothesis that PCUs save money at the end of life, without reducing quality of life, even if care is provided in a hospital setting. Such savings and good treatment suitability may be a means of promoting the much-needed development of hospital palliative care teams. Although results obtained are in line with other studies like Morrison et al 2011, we have not perform a propensity score matching between the two groups of study because it would not conform to reality and the outcome evaluated are not related to the effectiveness of the care received.³⁰

Conclusion

Results show that patients with advanced disease and high short-term risk of death, at the same rate of severity and mortality risk, cost is significantly lower when the patient is treated by a PCU during the last hospital stay when they pass away. Patients under 75 years old, cardiovascular disease DRG and the ones hospitalized in Non-PCU has a higher of having a cost above the median of the study population.

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