Original Article

Emergency Department Use by Terminally Ill Patients: A Systematic Review

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Abstract

Context. Terminally ill patients (TIP) frequently visit the emergency department (ED), but the prevalence of these visits is unclear.

Objective. To determine the prevalence of TIP visiting the ED.

Methods. Systematic review of observational studies published between 1998 and 2018 reporting adults TIP who used the hospital ED, searching in PubMed, CINAHL, SciELO, LILACS, and Cochrane. Three evaluators selected and extracted data (kappa concordance 0.63). The quality of the studies was evaluated with the Newcastle−Ottawa scale and global estimates were made, calculating combined prevalence (95% confidence interval [CI]) and heterogeneity of the studies (I^2).

Results. We identified 2429 publications, ultimately including 31 studies in 14 countries; 79% were from high-income countries, 21% from medium-income countries, and none from low-income countries. Most were from 2015. We found that 45% of patients with cancer visited the ED in the last month of life [95% CI 37−54%] and 75% in the last six months of life [95% CI 62−83%]; $I^2 = 100\%$. Overall, 17% of patients who visited the ED had a terminal illness [95% CI 12−23%]; $I^2 = 98\%$. Few studies reported terminal nononcologic illness, specific age groups or diseases, hospital admission rates, use of palliative care or nonresuscitation, or other criteria that could be used for grouping.

Conclusions. Patients with terminal cancer frequently use the ED at the end of life, although use varies among patients and few studies have examined low-income countries or patients with nononcologic terminal illness. The global prevalence of TIP in the ED cannot be calculated from limited reports. J Pain Symptom Manage 2021;61:531−543. © *2020 American Academy of Hospice and Palliative Medicine. Published by Elsevier Inc. All rights reserved.*

Key Words

Terminal care, emergency department, chronic disease, systematic review

Introduction

The purpose of the hospital emergency department is to save life in acute and unexpected events and to avoid disabling injuries. However, the characteristics of the patients treated, mainly in reference hospitals, have changed in recent decades. There is a greater demand for emergency care among patients with chronic diseases, which are complex, and these patients are often near the end of life.[1−3]

In addition, inequality in access to health services around the world is a known concern; socioeconomic development has a great influence on access to care. In this regard, care of terminally ill patients (especially palliative care) is very uneven; high-income countries generally have good coverage, but terminal disease

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care such as palliative care is almost nonexistent in low-income countries.[4–6]

Patients with advanced illness often present to the emergency department in the last months, weeks, or even days of life. Many times, the main causes of visits to the emergency department are poor control of established physical or emotional symptoms, or new manifestations of physical or emotional symptoms.[2,7–9] Barbera et al. reported that among 91,561 patients who died of cancer, during the final two weeks of life 31,076 patients (34%) made 36,600 visits to the emergency department. The most common reasons were abdominal pain, dyspnea, malaise and fatigue, and pleural effusion.[10]

Many times, these visits to the emergency department may be accompanying with exhausting and long waits, inappropriate use of resources and invasive interventions, and problems in quality and safety of care, which can be distressful for frail patients with advanced illness and their caregivers.[1,2,11] Supportive care/palliative care provision is largely framed around symptom management and promotion of quality of life of terminally ill patients. Delgado-Guay et al. reported in a population of advanced patients with cancer who had early referral to palliative care team from the emergency department led to earlier control of symptoms and shorter hospital length of stay, when compared with general inpatient palliative care consults.[9] Lacking these fundamental services in any clinical setting, including the emergency department can bring more suffering to this frail population and increase the costs of care at the end of life.[4,5]

The magnitude of emergency department use among terminally ill patients is not known exactly, apart from isolated reports.[11–13] In Ontario, Canada in 2010, 57.6% of patients with cancer visited the emergency department during their last month of life.[14] In Japan during 2010–2011, 71.7% of patients with lung cancer who visited the emergency department were in the terminal phase of the disease,[15] and in Australia, 52% of those who died of a disease (any disease, in those aged 18 years or older) had visited the emergency department during their last month of life.[16]

Therefore, in the present study, we sought to determine the frequency of emergency department use by terminally ill patients, specifically the prevalence of patients visiting the emergency department in their last months of life and the proportion of these patients among those visiting the emergency department.

Methods

Methodology

A systematic review was performed according to the recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement, following a predesigned protocol approved by the Research Ethics Committee of the University and registered in PROSPERO (international prospective register of systematic reviews), available at http://www.crd.york.ac.uk/PROSPERO/display_record.php?ID=CRD42018095894.

Identification of Studies

We analyzed observational studies (cross-sectional, prospective, or retrospective) to evaluate the prevalence and other factors associated with the visit to hospital emergency department of adult (aged 18 years or older) with oncologic or nononcologic terminal illness. Terminally ill patients were defined as those patients with any irreversible noncurable, chronic disease (oncological and nononcological) with limited life expectancy, generally less than six months.[17] We excluded studies in which the full text was not found.

Search Strategy

A bibliographic search was carried out in five specialized electronic databases (PubMed: Medline; CINAHL: Current Nursing and Allied Health Literature; SciELO: Scientific Electronic Library Online; LILACS: scientific and technical literature on health in Latin America and the Caribbean; and Cochrane Library) for studies published between January 1, 1998 and December 31, 2018, which included the following three terms: term 1: "patient" OR "admission" OR "hospitalization" OR "hospitalization"; term 2: "emergency medical services" OR "emergency"; and term 3: "terminally ill" OR "terminal" OR "palliative" OR "chronic" OR "end of life". Terms were searched in English, Spanish, and Portuguese languages. Additionally, using the snowball strategy allowed us to identify 22 more articles among the 2000 bibliographic references reviewed to address the primary aim of the study.

Study Selection

The lead author (J.A-T.) searched the titles and abstracts identified in the databases, and then Mendeley 1.19.4 software was used to identify duplicate articles. The authors independently reviewed the list of articles identified following predetermined selection items (participants, pathology, emergency use, and event studied), presenting good interevaluative concordance (Cohen kappa index 0.63). Disagreements were resolved by consensus.

Data Extraction

Data were extracted from the studies by the authors independently, following items from a predesigned data extraction sheet. Extracted patient information included location of treatment, date of treatment, and type of disease, and extracted study information

included type of comparisons, results, and study design.

Quality Assessment

The senior author (T.O-E.) assessed data quality and risk of bias in all included studies, applying the Newcastle–Ottawa scale. This scale assesses the quality of nonrandomized studies based on three criteria: the selection of study groups, the comparability of the groups, and determining the exposure or interest result.[18]

Synthesis of Results

Studies were also grouped according to age(s) of patients, disease(s) studied, and event evaluated (visit, admission, or death) in the emergency department.

The overall estimates in the pooled analysis were obtained using Meta XL (www.epigear.com) for Microsoft Excel 2010; a prevalence figure combined with a 95% confidence interval was calculated by combining estimates of the studies selected using a random effects model, a variant of the inverse of the variance method, which incorporates intrastudy and interstudy variability. Heterogeneity between estimates was assessed using the I^2 statistic, which describes the percentage of variation not caused by sampling error between studies. An I^2 value of >75% indicates high heterogeneity.

Meta-analysis

The meta-analysis evaluation included only studies with similar characteristics and those with a medium or good quality according to the Newcastle–Ottawa scale.

Results

Selected Studies

After applying our criteria, we identified 31 studies for our systematic review (Figure 1). Characteristics

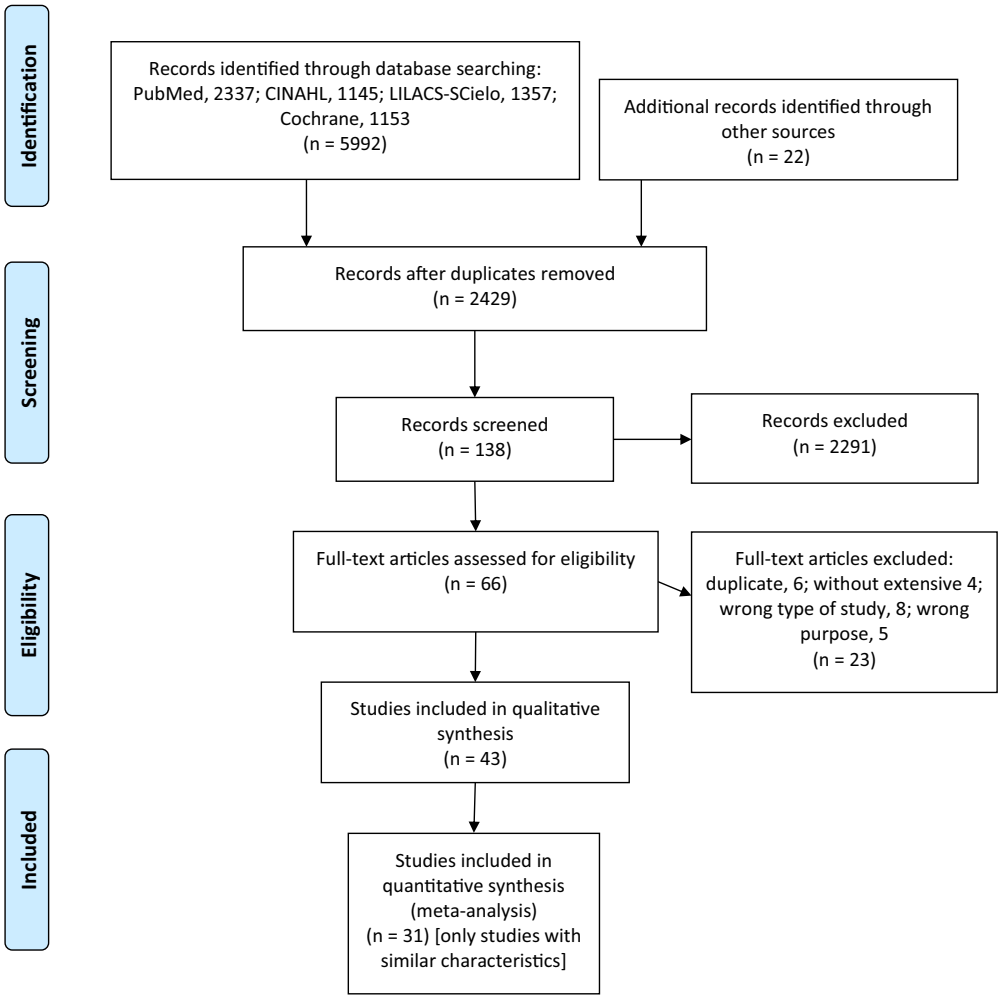

Fig. 1. Flow diagram showing study selection for our systematic review of emergency department use among terminally ill patients, 1998–2018.

Table 1

Characteristics of the Studies Included in a Systematic Review of Emergency Department Use Among Terminally Ill Patients Between 1998 and 2018

Primary Author	Year	Country	Type of Study	Duration	Date of Publication	Patient Age Ranges	Disease
Tardy[40]	2002	France	Cross-sectional	Two years	1997	All ages	Oncologic and nononcologic
Lawson[30]	2008	Canada	Retrospective	Seven years	1999	≥18 years	Palliative
Barbera[10]	2010	Canada	Retrospective	Four years	2002	≥20 years	Oncologic
Le Conte[41]	2010	France, Belgium	Cross-sectional	Four months	2004	All ages	Oncologic and nononcologic
Beynon[42]	2011	England	Retrospective	One year	2006	≥65 years	Oncologic and nononcologic
Damghi[25]	2011	Morocco	Cross-sectional	Five months	2009	≥18 years	Oncologic and nononcologic
Glajchen[31]	2011	USA	Cross-sectional	Eight months	2009	≥65 years	Oncologic and nononcologic
Rosenwax[45]	2011	Australia	Retrospective	Eleven months	2005	All ages	Oncologic and nononcologic
Smith[27]	2012	USA	Retrospective	Fourteen years	1992	≥65 years	Oncologic and nononcologic
Van Tricht[50]	2012	France, Belgium	Retrospective	Four months	2004	All ages	Oncologic and nononcologic
Ali[43]	2013	England	Retrospective	One year	2011	≥65 years	Oncologic and nononcologic
Richardson[35]	2013	USA	Retrospective	Eight years	2002	≥65 years	Oncologic and nononcologic
Bureau of Health Information[29]	2014	Australia	Retrospective	Four years	2006	All ages	Oncologic
Dargin[36]	2014	USA	Retrospective	One year	2005	≥18 years	Oncologic and nononcologic
Kotajima[15]	2014	Japan	Retrospective	Two years	2010	All ages	Lung cancer
Ouchi[32]	2014	USA	Cross-sectional	One month	2012	≥70 years	Dementia
Tanriverdi[51]	2014	Turkey	Retrospective	Two years	2011	≥18 years	Oncologic
Yildirim[37]	2014	Turkey	Retrospective	Two years	2011	≥18 years	Oncologic
Basol[38]	2015	Turkey	Retrospective	Two years	2011	≥60 years	Oncologic
Goldsbury[16]	2015	Australia	Retrospective	One year	2007	≥18 years	Oncologic and nononcologic
Lee[52]	2015	Taiwan	Retrospective	One year	2008	All ages	Oncologic
Rosenwax[53]	2015	Australia	Retrospective	Two years	2009	All ages	Dementia
Bekelman[14]	2016	Belgium, Canada, England, Germany, USA	Retrospective	One year	2010	≥65 years	Oncologic
Sullivan[44]	2016	Australia	Retrospective	One year	2011	All ages	Oncologic and nononcologic
Amado[39]	2017	Peru	Cross-sectional	One week	2016	≥18 years	Oncologic and nononcologic
Amado[26]	2018	Peru	Cross-sectional	Three months	2017	≥18 years	Oncologic and nononcologic
Hirvonen[33]	2018	Finland	Retrospective	Five months	2013	≥16 years	Oncologic
Hunt[28]	2018	USA	Retrospective	Three years	2012	≥65 years	Dementia
Lipinski[34]	2018	Canada	Prospective	Eight months	2013	≥65 years	Heart failure
Ni Chroinin[54]	2018	Australia	Retrospective	One year	2007	≥70 years	Oncologic and nononcologic
Siegrist[7]	2018	Switzerland	Retrospective	Five years	2012	≥18 years	Oncologic and nononcologic

Table 2

Characteristics of the Studies Evaluating the Frequency of Emergency Department Use at the End of Life, 1998–2018

Primary Author	Year	Country	No. of Patients	Age Range	Disease	Emergency Department Use	Comment
Visits to the emergency department the last month of life							
Smith[27]	2012	USA	4518	≥65 years	Any	51.00%	California
Bureau of Health Information[29]	2014	Australia	31,631	All ages	Oncologic	47.00%	New South Wales; diagnosis of cancer in the previous year
Yildirim[37]	2014	Turkey	107	≥18 years	Oncologic	59.81%	Mugla Hospital
Goldsbury[16]	2015	Australia	45,749	≥18 years	Any	52.00%	Died in New South Wales; 31% of the national population
Bekelman[14]	2016	Belgium	27,325	All ages	Oncologic	B: 35.70%	B: 95% of the national population
		Canada	28,102			C: 57.60%	C: Ontario; 38% of the national population
		England	1,29,117			E: 47.19%	E: Report from all over England and Wales
		Germany	30,277			G: 27.47%	G: Users of mandatory insurance; 10.4% of the national population
Bekelman[14]	2016	Belgium	21,054	≥65 years	Oncologic	B: 35.80%	U: Medicare beneficiaries
		Canada	20,818			C: 57.60%	
		England	97,099			E: 45.89%	
		Germany	24,434			G: 25.69%	
		USA	2,11,816			U: 46.30%	
Bekelman[14]	2016	Canada	4467	≥65 years	Lung cancer	C: 61.81%	
		England	21,092			E: 80.25%	
		Germany	3577			G: 57.34%	
		USA	44,942			U: 72.90%	
Hunt[28]	2018	USA	281	≥65 years	Dementia	57.00%	Medicare beneficiaries; 9.8% of data lost
Visits to the emergency department in the last six months of life							
Barbera[10]	2010	Canada	91,561	≥20 years	Oncologic	83.83%	Ontario; 38% of the national population
Smith[27]	2012	USA	4518	≥65 years	Any	74.99%	California
Bureau of Health Information[29]	2014	Australia	31,631	All ages	Oncologic	75.00%	New South Wales; diagnosis of cancer in the previous year
Bekelman[14]	2016	Belgium	27,325	All ages	Oncologic	B: 64.50%	B: 95% of the national population
		Canada	28,102			C: 88.30%	C: Ontario; 38% of the national population
		England	1,29,117			E: 79.46%	E: Report from all over England and Wales
		Germany	30,277			G: 49.56%	G: Users of mandatory insurance; 10.4% of the national population
Bekelman[14]	2016	Belgium	21,054	≥65 years	Oncologic	B: 64.50%	
		Canada	20,818			C: 88.10%	
		England	97,099			E: 78.40%	
		Germany	24,434			G: 46.76%	
		USA	2,11,816			U: 73.90%	

(*Continued*)

Table 2
Continued

Primary Author	Year	Country	No. of Patients	Age Range	Disease	Emergency Department Use	Comment
Bekelman[14]	2016	Canada	4467	≥65 years	Lung cancer	C: 91.00%	
		England	21,092			E: 49.32%	
		Germany	3577			G: 33.02%	
		USA	44,942			U: 44.90%	
Visits to the emergency department in the last year of life							
Rosenwax[45]	2011	Australia	1071	All ages	Any	70.00%	Western Australia
Goldsbury[16]	2015	Australia	45,749	≥18 years	Any	80.00%	Died in New South Wales; 31% of the national population
Lee[52]	2015	Taiwan	23,883	All ages	Oncologic	67.30%	National Cancer Program
Rosenwax[53]	2015	Australia	5261	All ages	Dementia	72.99%	Western Australia
Ni Chroinin[54]	2018	Australia	21,544	≥70 years	Any	79.45%	New South Wales

of these 31 studies are shown in Table 1. The included studies were divided into two categories by aim of the study: frequency of use of the emergency department at the end of life and proportion of terminally ill patients in the emergency department. Twelve of the studies were about the frequency of use of the emergency department at the end of life, and the other 19 examined the proportion of patients with terminal illness in the emergency department. These 31 studies presented data from 14 countries, of which 79% were classified as high income, 14% medium-high income (Turkey and Peru), 7% medium-low income (Morocco), and none low income, according to the World Bank. The studies were published in 2002 or later, most commonly in 2015 or 2018.

Emergency Department Use at the End of Life

Studies that evaluated patients visiting the emergency department at the end of life (Table 2) included patients of all ages, all adults (aged ≥18 or ≥20 years), or all older adults (aged ≥65 or ≥70 years) with chronic oncologic or nononcologic disease, sometimes specific diseases (heart failure, dementia, and lung cancer). Six studies evaluated emergency department visits in the last month of life; rates of emergency department use ranged from 26% to 61% for this group. Four studies evaluated emergency department visits in the last six months of life; rates of emergency department use ranged from 47% to 91% for this group. Five studies evaluated emergency department visits in the last year of life; rates of emergency department use ranged from 67% to 80% for this group. One study[10] presented data from five countries, presenting data individually by country. Only one study evaluating the use of the emergency department at the end of life was conducted in a country of not considered high-income (Turkey).

Proportion of Terminally Ill Patients in the Emergency Department

The studies that evaluated the proportion of patients with terminal illness in the emergency department (Table 3) included patients of all ages, adults (≥18 years), and older adults (≥65 years) with chronic oncologic or nononcologic diseases, sometimes specific diseases (dementia and heart failure). Seven studies evaluated the proportion of terminally ill patients among those who visiting the emergency department, and these proportions ranged from 8% to 72%. Six studies evaluated the proportion of terminally ill patients admitted to the hospital after visiting the emergency department, and these proportions ranged from 6% to 55% (three reports were from medium-high income countries: Turkey and Peru). Six studies reported the proportion of patients with terminal illness who used palliative care or made the

Table 3

Results of Studies on the Use of Emergency Department at the End of Life by Patients With Terminal Illness, 1998–2018

Primary Author	Year	Country	No. of Participants	Population	Pathology	Result Variable	Ratio	Comment
Emergency visits of patients with terminal illness								
Lawson[30]	2008	Canada	4444	18 years or +	All	Palliative care	26.60%	Queen Elizabeth Hospital
Glajchen[31]	2011	USA	1587	65 years or +	All	Advanced disease	8.82%	New York University Hospital
Kotajima[15]	2014	Japan	113	All	Lung cancer	IV clinical stage	71.68%	Saitoma University Hospital
Ouchi[32]	2014	USA	304	70 years or +	Dementia	Advanced dementia	16.78%	New York University Hospital
Hirvonen[33]	2018	Finland	482	16 years or +	Oncological	Palliative care	15.98%	Turku University Hospital
Lipinski[34]	2018	Canada	500	65 years or +	Heart failure	Palliative care	15.80%	Two Ottawa teaching hospitals
Siegrist[7]	2018	Switzerland	10,458	18 years or +	All	Decision to limit life support	23.29%	Basel University Hospital
Emergency admissions of patients with erminal illness								
Richardson[35]	2013	USA	63,96,910	65 years or +	All	Decision to limit life support	16.09%	375 hospitals in California
Dargin[36]	2014	USA	998	18 years or +	All	Decision to limit life support	5.81%	Massachusetts Lahey Hospital
Tanriverdi[51]	2014	Turkey	102	18 years or +	Oncological	With metastasis	53.92%	Mugla Hospital
Basol[38]	2015	Turkey	279	60 years or +	Oncological	Palliative care	54.84%	Eskisehir Information System
Amado[39]	2017	Peru	846	18 years or +	All	Terminal ill	7.09%	Three National Social Security Hospitals
Amado[26]	2018	Peru	4925	18 years or +	All	Terminal ill	5.50%	Rebagliati Hospital
Emergency deaths of patients with terminal illness								
Tardy[40]	2002	France	159	All	All	Terminal ill	35.22%	Bellevue University Hospital
Le Conte[41]	2010	France Belgium	2420	All	All	Palliative Care Decision to limit life support	56.74% 78.80%	171 emergency department in France (23% of the country) and three in Belgium
Beynon[42]	2011	England	102	65 years or +	All	Palliative Care	56.86%	Two hospitals in South London
Damghi[25]	2011	Morocco	177	18 years or +	All	Decision to limit life support	30.51%	Rabat University Hospital
Sullivan[44]	2016	Australia	652	All	All	Palliative care	19.63%	Queensland University Hospital

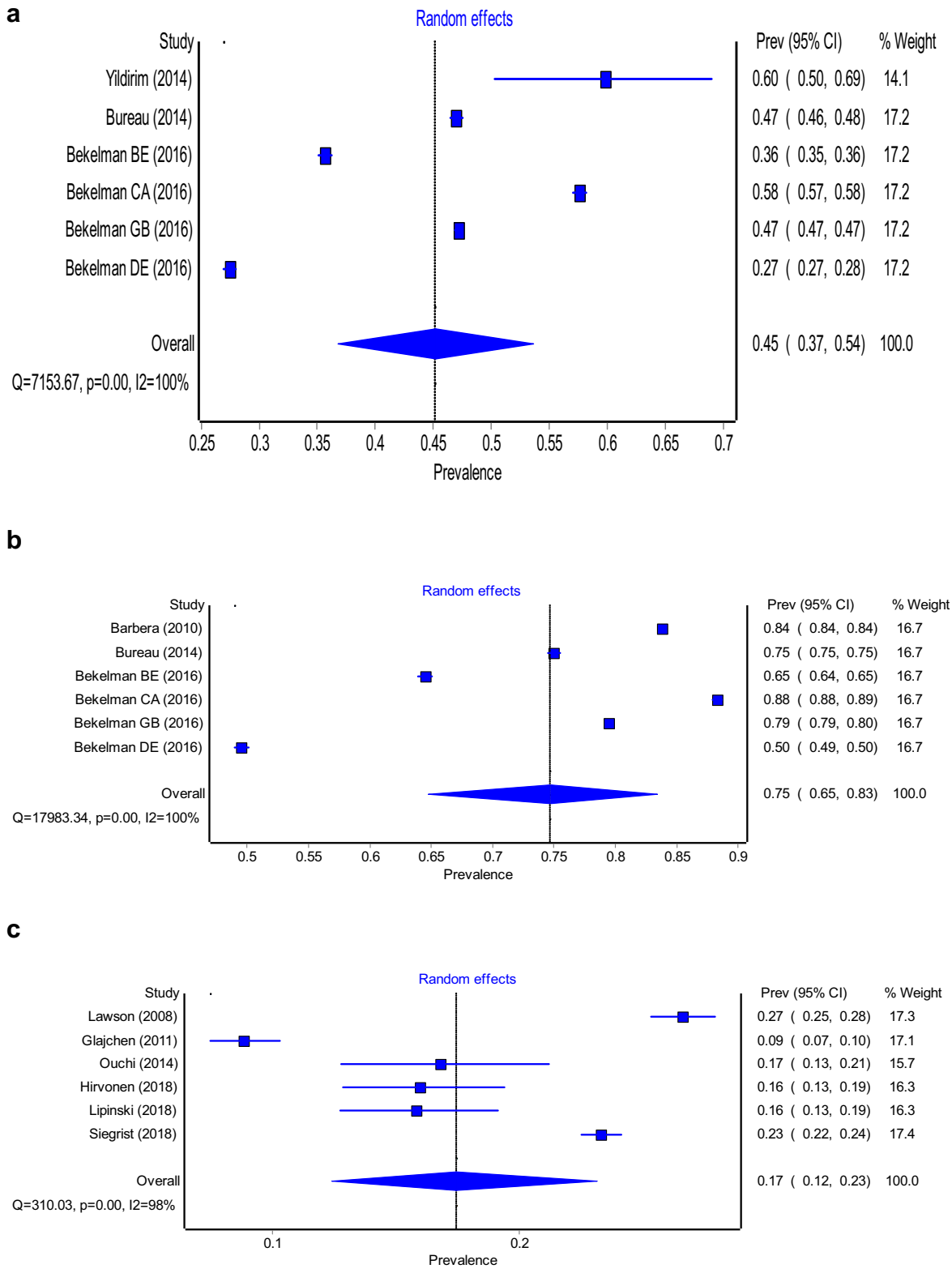

Fig. 2. Forest plot on prevalence of: a) Patients with cancer who visited the emergency department the last month of life; b) Patients with cancer who visited the emergency department the last six months of life; c) Terminal illness among patients visiting the emergency department; Systematic review, 1998–2018.

Table 4
Quality of the Studies of the Systematic Review of Patients With Terminal Illness and Use of Emergency Department Between 1998 and 2018. Those Who Presented Fair or Good Quality Were Included in the Meta-Analysis

Study	Selection	Comparability	Outcomes	Quality
Visits to the emergency department the last month of life				
Smith[27]	*		*	Poor
Yildirim[37]	**	*	**	Fair
Bureau of Health Information[29]	***	*	**	Good
Goldsbury[16]	**		**	Poor
Bekelman[14]	****	*	**	Good
Bekelman[14]	***	*	**	Good
Bekelman[14]	****	*	**	Good
Bekelman[14]	**	*	**	Fair
Hunt[28]	*		**	Poor
Visits to the emergency department the last six months of life				
Barbera[10]	***	*	**	Good
Smith[27]	*		*	Poor
Bureau of Health Information[29]	***	*	**	Good
Bekelman[14]	****	*	**	Good
Bekelman[14]	***	*	**	Good
Bekelman[14]	****	*	**	Good
Bekelman[14]	**	*	**	Fair
Emergency visits of patients with terminal illness				
Lawson[30]	**	*	**	Fair
Glajchen[31]	***	*	**	Good
Kotajima[15]	**		**	Poor
Ouchi[32]	***	*	**	Good
Hirvonen[33]	**	*	**	Fair
Lipinski[34]	**	*	**	Fair
Siegrist[7]	**	*	**	Fair

decision to limit support (order of nonresuscitation), and these proportions ranged from 8% to 57%. One of these studies was conducted in Morocco (a country of medium-low income).

Meta-analysis

About 45% of patients with cancer had emergency visits in their last month of life and 75% in the last six months. About 17% of the patients who visited the emergency department were terminally ill (Figure 2). All of these studies were conducted in high-income countries with sufficient quality considered (Table 4).

Discussion

The estimated prevalence of emergency department visits among patients with cancer in their last month of life averaged about 50%, and among patients with cancer in their last six months of life, the prevalence averaged about 75%. This constitutes a high frequency of use of a medical resource primarily designed for acute conditions among patients not only with terminal illness.

Remarkably, patients with advanced illness near the end of life generally report wishing to be cared for at home as much as possible until the end of their lives.[19] Regardless of this preference, these patients often present to the emergency department in the last months, weeks, or even days of life and ended dying in hospitals.[19,20] Unfortunately, despite these findings primarily reflect practice in high-income countries where palliative care has been established for decades; the presence of these data indicates high poor-quality of end-of-life cancer care indicators (high number of emergency department visits, multiple hospital admissions, intensive care unit stays near the end of life, and patients dying in an acute hospital setting).[21,22] At the same time, these data may also reflect great variability in the practice of this type of care,[14] health insurance coverage, as well the care of terminally ill patients, including early access to palliative care services and hospices services.[3,4]

Multiple visits to the emergency department can also be affected due to the aggressiveness of cancer treatment near the end of life. These emergency department visits have been increasing over time in the U.S and Canada, although is higher in the U.S.[23,24] Other important factor to consider is that even in some high-income countries, where the health insurance coverage is not universal, patients with advanced illness who do not have insurance or social support might use the emergency department more

frequently as a source to try to control their symptoms until the end of their lives.[4,11,14]

In middle-income countries more than 5% of emergency admissions correspond to patients with terminal illness, these patients might have prolonged hospital stays and high rates of death while in institutional care, also at least 30% of patients who died in the emergency department had the decision to limit their life support.[25,26] Rates of institutional death and prolonged hospital stays could be even greater in low-income countries, where health systems have many shortcomings and many health-care disparities can occur; being more evident in rural areas, where the patient can leave without specific diagnostic or treatment or must migrate to the city in search of more complex care.[5,6] More research is needed to identify these indicators of quality of cancer care in different countries.

Emergency department use during the last month of life was similar among patients with cancer and those with other terminal illness, even dementia; however, there were few specific studies of nononcologic terminal illness.[16,27,28] Emergency department use between cancer and noncancer patients was also similar during the last six months of life.[10,14,29] It should be noted that many of the studies included very aggressive diseases such as lung cancer, which even in high-income countries is associated with frequent use of the emergency department, owing to the high rates of morbidity and mortality.[14,15]

The overall estimated proportion of patients with terminal illness among those visiting the emergency department was 17% in high-income countries. These countries have a relatively high proportion of patients with degenerative and oncologic diseases in part because of extended lifespans, and these diseases are more common in elderly populations. The presentation of these diseases can also vary over a wide range of time (e.g., 10 years). These factors all influence the results we observed in our analysis.[7,30–34]

Among patients admitted (hospitalized) in the emergency department, the studies reported a higher proportion of terminal cancer than nononcologic terminal illness; however, few publications reported emergency department use specifically among patients with nononcologic terminal illness. Further research is needed to determine the prevalence of patients with nononcologic terminal illness in the emergency department.[26,35–39]

Regarding the percentage of patients with terminal illness among those who died in the emergency department, the data were variable and did not allow reasonable approximations. However, some reports noted that at least 20% of those who died in the emergency department had already received palliative care.[25,40–44]

A number of published articles reported the use of the emergency department among patients with terminal illness. Most of these studies were retrospective. Although we found few studies reporting specific age groups or diseases, we did find more studies covering specific groups than what has been reported in previous reviews.[8,11,12] Using appropriate methodology for examining prevalence rates, we found a number of publications from the last five years, in accordance with the greater importance that palliative care has been given in the practice of medicine during this period.[4,6]

The high-income countries where the studies were conducted included the U.S., Canada, Australia, and England, where health-care systems are well-structured and include a palliative care–oriented approach.[10,14,30,42,45] Palliative care has received more limited attention in low-income countries such as those in Africa, Asia, and even Latin America. Although the epidemiologic profile of these countries differs from that of high-income countries in terms of age-related chronic diseases, chronic infectious diseases such as HIV infection or tuberculosis in low-income countries also produce pain and suffering often requiring emergency care.[5,6]

It is extremely important to provide appropriate palliative care to patients presenting in the emergency department[9] to control their symptoms and to improve the quality of life of these frail population, and to prevent potentially avoidable emergency department visits[46–48]

Although the number of studies covering specific diseases and age groups varied, the most studied group was consistently elderly patients with cancer. This could reflect better-structured services for patients with cancer compared with other diseases around the world. However, nononcologic diseases are also common and require equal or greater care to that required for cancer.[10,49]

The present study was limited by our use of very broad search terms, a broad period (20 years), and only three languages; the definition of terminal illness is not uniform and observational studies also limit the generalizability of our results. Nonetheless, the studies examined in our review illustrate the problem of emergency department use among patients with terminal illness; even in high-income countries, knowledge of palliative care is needed to treat these patients. Our analysis also reveals the lack of publications on this topic from low-income countries, as well as the need to improve health-care systems to adapt the changing needs of an aging and frail

population. At the same time the importance of an early integration of palliative care services to help these patients in suffering to improve their symptoms, their quality of life, and to optimize health system resources.

In conclusion, our systematic review revealed a high frequency of use of the hospital emergency department among patients with terminal illness, especially cancer. At least four of ten patients with oncologic terminal illness visit the emergency department in their last month of life and seven of ten do so in their last six months of life in high-income countries. Almost two of ten patients treated in the emergency department in high-income countries have a terminal illness. However, further studies are needed to clarify these prevalence rates, especially among patients with non-oncologic diseases and in countries with medium and low income. The global prevalence of patients with terminal illness in the emergency department cannot be calculated from limited reports.

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